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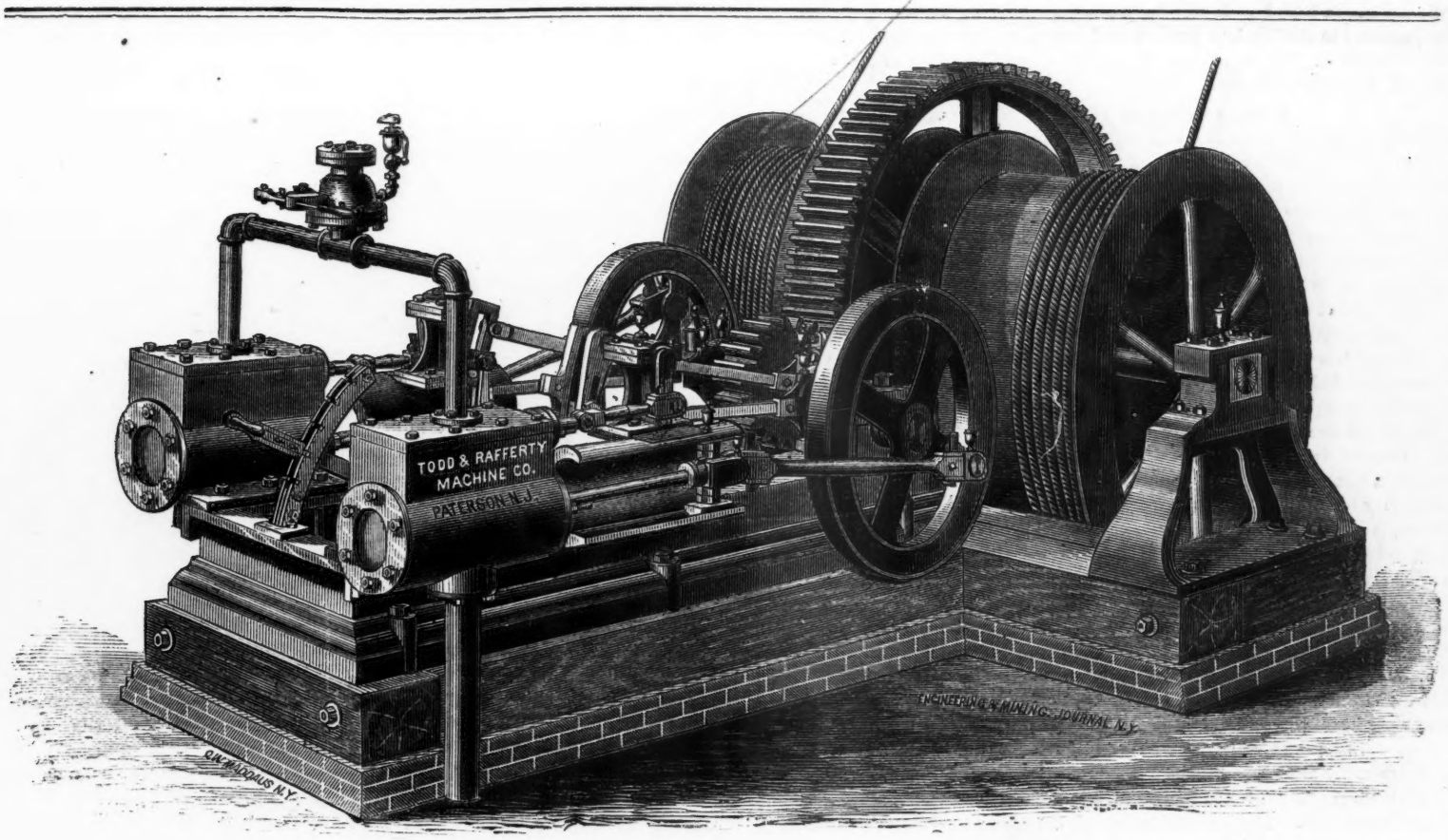


*THE TODD AND RAFFERTY MACHINE COMPANY'S HOISTING ENGINE.*

## Hoisting Engine by the Todd and Rafferty Machine Co.

WE PRESENT this week an illustration of a double reversible hoisting engine with drum attachments, made by the well-known manufacturers of machinery, the TODD & RAFFERTY Machine Co., of Paterson, N. J. A great number of their engines are in use in the mines, mills and furnace establishments in Pennsylvania. They can boa t that one firm, the great Thomas Iron Co., has no less than *sixty* of their engines in constant use, a proof of the good service and economy of their machines which it will be difficult to match.

They use the link motion for reversing, self-p cking pistons, and other of the best and most durable devices, building all their engines for strength and continuous service. The engine we illustrate differs from their former make only in those minor points of arrangement which are constantly under revision in all machine shops. It has two drums, winding and unwinding at the same time, geared to the engine by spur wheels. The handiness and simplici'y of the arrangement is sufficiently apparent from our engraving, and if any further information is desired, it is easy to ascertain from the makers where an engine of their make is to be found and inspected.

## The Treatment of Gold and Silver Ores by Wet Crushing and Pan Amalgamation Without Roasting.*

By J. M. ADAMS, E. M., of Silver City, Idaho.

CONTINUED FROM PAGE 306.

AS REGARDS the supply of water for the battery, there should be as much fall as possible from the battery to the tanks, so that the conducting troughs will keep clear and not choke up; they will then require no excess of water. The supply to the battery must vary according to the clay in the ore. Use as little water as practicable, consistent with keeping the screens perfectly clean. The more clay, the more water needed; the more clay, the greater necessity for careful low feeding in order to avoid the choking up of the mortar. If too much water is used, to remedy the effect of careless feeding, an unnecessarily large amount of slimes is carried off out of the mill in the waste water from the battery and tanks. To avoid loss of slimes, it is well to use a rather coarse screen, say No. 4, punched Russia iron—especially in clayey or slimy ores, so as not to *puddle* or churn the ores in the mortar more than necessary. This is particularly to be looked after, when the ore is largely true silver ore, or the gold very fine. As regards setting the battery, it is, in my judgment, preferable to give the central stamp of the five in each mortar the most drop, those adjacent on each side ¼ in. less, and the outside ones ¼ in. less still. But some millmen prefer an even set.

Many persons advocate amalgamation in the battery, in order to catch part of the gold and native silver in ores containing, in addition to these metals, silver sulphuret, chloride, etc., or gold coated with oxide of iron, etc., and therefore requiring subsequent reduction and grinding in the pans. But there is a strong objection to amalgamation in the battery. The amalgam thus formed is mostly a gold amalgam, and hence is worth much more than the ordinary amalgam of a silver mill—and of this the workmen are well aware. It is therefore an additional temptation to stealing. The only benefit to be claimed for it is the possible catching of some of the gold otherwise floating away in the water and catching in the slimes. It will be found, however, that this amount of gold is very small. By determining the proportion in weight of battery slimes, that is, the fine clayey material carried away in the waste water from the tanks and battery, which has never been in the pans, and by ascertaining the value of the slimes in gold, proportional to the value of the ore in gold, it will be found that, as a rule, the entire loss in gold in the slimes is not over 1 per cent. of the entire amount of the gold in the ore. This is not a very heavy loss; and besides, most of this gold can be collected in the slime yards, while, of the remainder, much is so fine that it is doubtful if quicksilver in the battery would catch it. The saving, then, is very

* A paper read before the American Institute of Mining Engineers, New York, February, 1874.

small, if there be any, on ordinary ores. But on the other hand, it is not practicable to use quicksilver without a mechanical loss; and, the quicksilver being more or less charged with gold, the loss of such as is not gathered and united, involves more or less gold also. Every casting, such as a shoe or die, in the battery, is full of flaws and blowholes. Hard gold amalgam collects in these, and in spite of the most careful picking and breaking (to say nothing of the occasional carelessness of workmen) every shoe and die, when used up and thrown away, contains a very considerable amount of gold amalgam. The cracks in the wooden troughs get filled with gold amalgam, the settling vats or tanks have their seams, after a long time, caulked with it; and in the slime yards will be found some of the gold partially amalgamated. Why should we then amalgamate in the battery, when we know that, except a very small and doubtful saving from the gold of the slimes (which seems offset by the mechanical losses above alluded to) all this gold is saved just as thoroughly in the cast iron pans. The pulp is not concentrated before entering the pans; if it underwent such a process, of course there would be additional chance of loss of fine gold, and additional argument for amalgamation in battery. It will be perceived that the reasoning just given applies therefore to the Washoe process, and not necessarily to gold mills where pans are not used. Yet even there, the practice of amalgamation in battery is not universal, nor indeed the best.

### 3. THE SETTLING IN THE VATS OR TANKS.

There should be as many tanks as possible, in order to settle the maximum quantity of slimes inside the mill; and the system should be so arranged that, as each tank is emptied of sand, the escape or waste water can be turned into it. Each tank thus becomes in turn the final one of the series, and receives all the water after settling through all the other tanks. There should never be more than three tanks full of sand; the remainder, even where there are 20 of them, should be used for the settling of the slimes in the water.

Each tankful of sand must be settled or prepared so that the contents can be easily handled with the shovel and charged into the car for transferral to the pans. In other words, the superfluous water must be removed; and this should be done without allowing the slimes to pass out of the tank, only to be carried by the current through the other tanks, and thus be driven ahead constantly towards the escape. Hence, it is well not to settle the sand at all, till the tank is full of sand. Then let the spouts be turned into the next tank, and put in the plugs of the full one, thus cutting off communication, and isolating this tank, after which the sand may be settled with crowbar and shovel, and the water bailed out.

The ore is now in the shape of a wet, coarse sand, called *pulp*, containing, according to its original nature and the character of the crushing, more or less slime (locally called "slum.") So far the process has been entirely mechanical; and the efficiency which has been achieved in this part of the treatment is measured by mechanical tests. The result with the arrangements above described may be summarized as follows: 48 tons of hard ore crushed with 20 stamps, of 650 lb., dropping 8½ inches, 95 times a minute, the ore from the breaker being fine, No. 4 screen being used. This is per 24 hours 2 4-10 tons per stamp, or 1.39 tons per horse-power developed.

### 4. THE TREATMENT OF THE PULP IN THE PANS.

There are many different styles of pans. I prefer the Wheeler for a small pan, and the Stevenson mould-board pan where a large one is desired. The general principle is the same. The ore is to be heated and ground thoroughly to an impalpable substance; an active motion or circulation given to the pulp; the silver thoroughly reduced; the gold thoroughly brightened and cleaned from its occasional intimate mechanical mixture with foreign minerals; and finally the gold and silver are to be as entirely as possible taken up by the quicksilver. Chemicals are used, partly to reduce the ore, partly to save quicksilver and keep it clean, and partly to reduce by cheaper means what would otherwise be reduced at the expense of the quicksilver.

When each charge is drawn it is well to wash out the pan with water, so as to get all the quicksilver possible out of the pan. There will still remain from 30 to 60 pounds in a flat bottomed pan (though this form is on other accounts to be preferred) under and around the dies or the lower grinding surface; and there will be also more or less amalgam sticking in various places on the sides of the pan, the muller, etc. Charge the pan with the muller raised, and turn live steam directly into the pulp. This method is preferred, because, in is way, the pan is heated much more rapidly than by a jacket, or double sides and bottom, filled with the exhaust steam; and little work can be done by the pan until the charge is heated. The pulp should be heated almost to boiling. The consistency of the pulp, when the quicksilver is put in, should be as thick as possible, consistent with a good circulation in all parts of the pan; but inasmuch as the pulp will be ground faster when thin, it is best to have it thin at first. To secure both objects, the pulp may be diluted to such a degree that after grinding 2½ hours, it will have thickened to the proper consistency for receiving the quicksilver. If this condition is fulfilled, the quicksilver charged into the pan will, after its speedy division into small globules, occasioned by the grinding and the heat, be diffused through the whole mass. A sample of the pulp taken out on a thin wooden spatula should show particles of uniformly disseminated quicksilver. Some of the globules will be microscopic; but from an ounce of the pulp, washed in a horn, a good sized globule of quicksilver may be collected by rubbing, etc. The pulp, if of proper consistency, will have a good motion, yet be thick enough to carry the quicksilver in suspension just to the surface, as the current rises from under the muller on the outside of the pan. On the other hand, the larger globules of quicksilver will be able to gradually sink through the pulp. Thus the quicksilver describes a course distinctly its own, and a more intimate contact is thereby attained.

If salt is used, it should be introduced as soon as the pan is charged. Sulphate of copper, if used, should be added as soon as the pan is heated up, which ought to take place in fifteen minutes. Then the steam should be shut off, and the muller lowered; and grinding commences. The reason for not lowering the muller at the start is to save power, since the pan will grind but poorly, and that with difficulty, in the cold pulp. If the pan has a cover on it (as all pans should have), probably there will be no necessity for using the steam again, till the charge is drawn and a new one put in, since sufficient heat will probably be retained to render amalgamation effectual.

It may be assumed, as a fair average, that the charge is run five hours. All the chemicals used, except those of saving quicksilver, are put in the pan at different times, and after the last one is put in, there should be at least 20 minutes before the quicksilver is charged. I prefer to put in the quicksilver in the middle of the period: *i. e.*, 2½ hours before drawing the charge, and use at the rate of 200 lb. quicksilver per 2,000 lb. of ore, or a larger proportion of quicksilver if required by the richness of the ore. Three-quarters of an hour before discharging, the muller is raised, since, if the pan is in good order, the charge should be by this time thoroughly ground, and raising the muller avoids further cutting up of quicksilver by the grinding. At the time of raising the muller, the chemicals used for saving quicksilver may be added. Fifteen minutes before drawing the charge sufficient water is added to thin the pulp thoroughly. This prepares the charge to flow readily out of the pan, and also stirs up any pulp that may be moving sluggishly. At the same time, the mass is considerably cooled.

The range of these remarks being purely mechanical, the subject of chemicals (mainly salt and sulphate of copper), in the pans will not be here discussed. Suffice it to say at present, that my practice and numerous experiments have disposed me strongly in favor of using chemicals, and using them largely. When only a low percentage is expected, and from a docile ore, there is often no need of any chemicals at all, though even then a judicious use of suitable re-agents will save some of the quicksilver. The more refractory the ore, the greater necessity for chemicals, and for high heating of the pans. From ordinary and docile ores 80 per cent. of the assay can, in some cases, be readily obtained without use of chemicals, by enforcing all the small mechanical details such as those I have referred to, and by keeping the quicksilver in perfect order. The additional percentage obtained running up to 95 per cent., and over, which I myself have frequently obtained on gold and silver ores, is only to be gained by the use of chemicals.

The most important point in the process is to keep the quicksilver always bright, clean, active and in good order. In working an ore that fouls the quicksilver, if it is not practicable to keep the quicksilver clean in the pan, it should at least be put in perfect order, before it is again used for another charge. In such cases, it is important to keep the pan as free from quicksilver as possible during the first part of the process. For cleaning quicksilver, sodium amalgam, caustic potash, dilute acids, cyanide of potassium, etc., are used. Even in working docile ores, it is well to keep a cleaning mixture on the quicksilver under the strainers.

The consumption of iron in the pans is about 10 lb. per ton of ore; but this, I think, can be diminished without loss of efficiency in grinding.

From the pan the charge is drawn into the settler.

### 5. THE RESULTS OBTAINED IN SETTLERS, AGITATORS AND CONCENTRATORS.

On drawing the charge, the greater part of the quicksilver runs quickly into the bowl or reservoir of quicksilver in the bottom of the settler, whence it flows out, free from sand, through a siphon into a kettle outside. It is preferable to fill the settler, when the charge is drawn, with water falling as a rain, and when the settler is full, to let nothing run out, but turn off the water and run the stirring-arms in the charge for an hour. This collects the floured quicksilver somewhat, and settles it. Then turn on plenty of water and let the settler discharge through the top plug-hole as long as possible. The operation should be so timed as to reach the bottom hole of each individual settler only just in time to receive the next charge. The settler will never choke with heavy sand, if the pan has ground well and the driving-belt is in good shape. In the settler accumulate some coarse sand, some unreduced sulphurets, amalgam, quicksilver and iron from the pans; and once a week the settler should be cleaned out, and the concentration re-worked in the pans.

A good supply of water should be kept constantly running in the agitators. Here there will be found some coarse sand, containing a little quicksilver, amalgam, sulphurets and considerable iron; but the saving is very small. The floors throughout the mill should be kept clean, and the whole mill as neat and free from dirt as possible; no loose quicksilver should be found on the floors, on the tables, or anywhere; all drains should lead into the agitators; and the quicksilver floor, unless the weather be too cold, should be washed with a hose every day.

Except on ores containing a large proportion of heavy sulphurets, or containing much slime that coats quicksilver, I have found but little benefit in concentrators applied to tailings from the pans. In ordinary cases, they collect little except iron from the pan and coarse sand. The pans grind so fine that the precious metal left in the tailings is very difficult to concentrate after leaving the agitators—provided the ore has been well worked. It is necessary to have a regular supply to the concentrator; and this may be effected with siphons of 1½ in. and 2 in. pipe. I have found Hungerford's concentrators very good for slimes

and slimy ores, since the shaking collects the floured and slime-coated quicksilver very well. After leaving the concentrators, the tailings were run, in the Owyhee mill, over a double set of blanket sluices, 250 feet long; but it was found that on the ores then worked, the saving did not pay for the labor employed in frequent washing; and at last the blankets were washed only about once a week.

6. THE STRAINING OF QUICKSILVER, CLEANING OF AMALGAM AND RETORTING.

The quicksilver collected in kettles outside the settler is strained through canvas sacks; the amalgam collected is cleared from the small mechanical impurities in a "cleaning pan," then re-strained and retorted in an iron retort, beneath which fire is kept up for 8 to 12 hours. The distilled quicksilver is condensed by a sleeve, around the escape pipe, filled with water. After cooling, the retort is opened, and the bullion is taken out and delivered to the assayer.

The retort is a source of considerable expense in milling. My experience leads me to prefer a cylindrical retort of cast-iron, weighing about 1,200 lb. and 14 ×48 in. inside dimensions. This style has various external shapes, doors, etc. The main trouble in retorting is this: with a long continued, bright cherry-red heat at the last, almost, but not quite, all of the quicksilver can be volatilized. The sublimation of the last 1 or 1½ per cent. cannot be effected without heating the retort, till part of the bullion is melted, which requires a white heat. At this temperature, the iron loses its tenacity, becomes spongy and rotten, and easily changes its shape. In a short time, under this treatment, the retort becomes distorted, even if turned around frequently, and after a time it bursts, frequently volatilizing up the chimney 200 lb. of quicksilver. Three or four such experiences a year are rather expensive. I have made many experiments, such as retorting in vacuum, firing twenty-four hours at a moderate heat, etc., but finally concluded to brace the retort as well as possible, never heat it above cherry-red, and submit to the loss of one per cent. of quicksilver for the present. In one's own assay office I think it can subsequently be saved, during melting, by a condensing chamber in the stack or chimney.

Even at a cherry-red heat, however, the retort gradually gets out of shape; and once out of shape it soon bursts or cracks. To preserve the original shape as long as possible, I found it advantageous to hang the retort on four slings. Each of these is a semi-circular cast-iron brace, on which the retort rests; wrought-iron rods, so attached that they can be renewed if burned out, are fastened to the cast-iron braces; one on each side of each brace. These rods pass through the brick-work, and through flat bars of iron on top; and have, above all, loosely fitting nuts. Of the flat bars, on the top of the brick-work, four pass across over the retort on top of the brick-work, and two lie lengthwise, one on each side. Thus the retort is hung on four braces, attached to one common support. If it becomes bulged at all, the sling nearest the distorted place may be raised by means of the nuts, and in the next heat the retort will resume its proper shape. In this way, and by a careful and moderate heat, I was able to make retorts last 1½ years in constant use.

7. THE SAVING OF SLIMES AND SUBSEQUENT TREATMENT.

By slimes or slums I do not mean to include any slimes whatever from the pan tailings. If the ore has been properly and exhaustively worked, there is not left in any part of the tailings from the pans, any gold or silver that can be recovered by working these tailings, unless they be roasted, or exposed to action of air and moisture for many years. The slimes here spoken of have never come in contact with quicksilver, and have never been worked at all; they are carried off mechanically by the waste water that leaves the last tank below the battery; and they assay, as a rule, about 60 per cent. as much as the ore. Generally the assay buttons from the slimes are worth much less per ounce than from the ore, *i. e.*, they contain proportionally less gold. The percentage of slums varies with the amount of clay, and also depends much on the quantity of water used, and the method of settling. In hard ores, with careful settling, slimes amount to 2 or 3 per cent. of the weight of the ore. The gold in the slimes is very light and flat; the silver occurs largely in refractory sulphurets, and also in a very finely divided state. The slimes from ore worth $16 a ton or upwards, may be worked with profit. In one's own mill, working one's own ore, it would be economical to raise to a supply tank above the battery, all the water escaping from the tanks, and let it pass again with the additional water necessary through the battery. Thus there would be no loss in slimes, as none would leave the mill. But frequently such a change cannot be made in an old mill. In such cases, it is necessary to build a slime yard outside the mill. I built my first one in the summer of 1868, after studying a year on the best way to save the slimes; and subsequently I added others, constituting a series, in each of which in succession all the battery water settled before finally escaping. By means of a bull-wheel, rope, car and railroad, the slimes were delivered, when they were to be worked, directly to the pans. The richest of the slimes settled in the first yard, since none of them had ever been in contact with quicksilver, or worked in any way; and they were kept entirely separate from the pan-tailings. Working these slimes by themselves, it is difficult to obtain over 60 per cent. of the assay-value, even when large amounts of chemicals are used. Moreover, the loss of quicksilver is very large. But by mixing ore and slimes in equal proportions, more "body" can be given to the pulp, and in this way I obtained almost as high a percentage as on ordinary ore, and saved much of the quicksilver that would have been lost. The gain was so decided that, not having a mine, I bought ore to mix with the slimes.

8. THE LOSS OF QUICKSILVER.

Every piece of wood that has come in contact with quicksilver, the canvas straining-sacks, the worn out pan-shoes and dies, even after careful washing and breaking, the thoroughly washed and shaken quicksilver-flasks, the used-up kettles and dippers, the floors, etc.—all have quicksilver sticking to them; the men carry quicksilver on their boots and clothes, and it is found scattered in very small quantities outside of the mill. It goes everywhere. Drop a globule on the floor; you cannot entirely recover it. Climb up 40 or 50 feet to the cross-timbers in the top of the mill; collect some of the dust on top of the timbers; examine it with a glass, or wash it, and you will find quicksilver. Some is lost every time crude bullion is melted. Every pound of quicksilver is handled probably forty times a day, and every time there is a little loss. (Quicksilver should be handled as much as possible mechanically, being raised by steam in pipes, or some other arrangement.) Quicksilver not covered with water or other liquid, evaporates in the air. These losses can only be prevented partially by the greatest cleanliness.

Again, quicksilver charged with copper readily becomes coated with small particles of iron. In the pulp it is readily coated by iron pyrites, grease, slimes, etc., or reduced to great fineness by grinding. In these "floured" and coated conditions, much of it will float away and be lost, unless means are employed to collect it. I have found cyanide of potassium very effectual for this purpose; thorough settling also collects a good deal. Ores containing much talc likewise act unfavorably on quicksilver. As soon as quicksilver is fouled and becomes sluggish, it not only loses to a large extent its amalgamating power, but also is easily cut up and floured.

In addition to the sources of mechanical loss above mentioned, much of the quicksilver is lost chemically. The water from the settler, if filled and concentrated, will show quicksilver present in solution. Sulphate of copper in solution is decomposed by quicksilver; some of the quicksilver becoming sulphate of mercury, while the precipitated copper forms a copper amalgam with the remaining quicksilver. Chloride of silver also can be decomposed by quicksilver, chloride of mercury being formed. If binoxide of manganese is present in the ore, it occasions a heavy loss of quicksilver, also, as I believe, by chemical action. And I might mention other chemical reactions, causing loss of quicksilver. Hence, the importance of keeping the pan as clean as possible of quicksilver in the first half of the period of working the charge. The grinding in the first half will not cut up and flour the quicksilver; the chemicals can act on the ore, and not on the quicksilver; and the silver minerals will be reduced by the chemicals, instead of having the expensive quicksilver consumed by reducing some of the minerals or combinations. By observing this rule, by using chemicals for saving quicksilver at the end of the charge, and by subsequent careful settling, I have found it possible to diminish very much the loss of quicksilver that would otherwise occur.

In conclusion, I have only to say that, in my opinion, even base and refractory ores can frequently be worked more profitably by this process, than by the vastly more expensive methods of dry crushing, roasting, smelting, etc.

Much of the credit to be given for many points brought forward in this paper, is due to Mr. WM. F. CARTER, Mechanical Engineer, who has worked with me constantly for several years past.

DISCUSSION.

MR. RAYMOND said, we have in the papers read by Mr. HOLLEY and Mr ADAMS, a good illustration of the importance of little things in the perfection of a process. As to the question whether we shall try to extract all the gold and silver from the ore at once, or whether we shall aim only to extract part, and then work over the tailings to get the rest, there might be a difference of opinion. It is the same question that agitates coal miners, as to the relative advantages of long wall and pillar system. Mr. ADAMS is, however, just in his statement, that there is nothing in the tailings which can be gained by simply repeating the operation, except what has been unnecessarily lost in the first operation.

## Analyses of Stolberg Lead.

WE have received from Mr. WILLIAM PAULSEN, 10 Burling Slip, New York, sole agent of the Stolberg Company, the following letter:

TO THE EDITOR: Sir—In your last issue of May 9, 1874, you had a very interesting article on foreign and domestic leads, and their virtues for the manufacture of white lead. The Stolberg Company, at Aix la Chapelle, sent me by last mail a statement of analyses of the *Stolberg Selected Lead* for fifteen months, and thinking that it may interest you, I beg to hand you a careful copy of it.

The analyses referred to give the composition of the lead as ascertained by the continuous work in the laboratory of the company. They form one of the most interesting series of lead analyses ever published.

| 1873. | Copper. | Antimony, per cent. | Iron, per cent. | Zinc, per cent. | Silver, per cent. | Total, per cent. |
|---|---|---|---|---|---|---|
| January | trace. | 0·00334 | 0·00041 | 0·00026 | 0·00060 | 0·00461 |
| February | " | 0·00451 | 0·00076 | 0·00138 | 0·00060 | 0·00725 |
| March | " | 0·00300 | 0·00049 | 0·00019 | 0·00060 | 0·00428 |
| April | " | 0·00276 | 0·00151 | 0·00180 | 0·00060 | 0·00667 |
| May | " | 0·00160 | 0·00117 | 0·00120 | 0·00080 | 0·00477 |
| June | " | 0·00302 | 0·00066 | 0·00058 | 0·00070 | 0·00493 |
| July | " | 0·00298 | 0·00186 | 0·00120 | 0·00060 | 0·00574 |
| August | " | 0·00417 | 0·00254 | 0·00305 | 0·00060 | 0·01036 |
| September | " | 0·00304 | 0·00102 | 0·00099 | 0·00060 | 0·00566 |
| October | " | 0·00298 | 0·00113 | 0·00156 | 0·00060 | 0·00627 |
| November | " | 0·00406 | 0·00074 | trace. | 0·00060 | 0·00540 |
| December | " | 0·00229 | 0·00182 | 0·00280 | 0·00060 | 0·00751 |
| 1874. | | | | | | |
| January | " | 0·00212 | 0·00098 | 0·00244 | 0·00060 | 0·00614 |
| February | " | 0·00235 | 0·00081 | 0·00208 | 0·00060 | 0·00584 |
| March | " | 0·00295 | 0·00117 | 0·00061 | 0·00060 | 0·00533 |

The average amount of foreign metals is 0·00605 per cent., or 1¾ ounces Troy in 2000 lb. Avoirdupois of lead. The Stolberg brand is largely imported and used by the white lead makers of the Atlantic States. Its purity is such as to make it apparent that in this respect nothing remains to be desired.

# THE ENGINEERING AND MINING JOURNAL.

**NEW YORK, SATURDAY, MAY 23, 1874.**

ROSSITER W. RAYMOND, Ph. D., JOHN A. CHURCH, E. M., } Editors.

RICHARD P. ROTHWELL, C. E., M. E., Editor of the Coal and Iron Department.

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AN evil fate seems to have followed us for several weeks, in our endeavors to notify the members of the Institute of Mining Engineers of the time of the St. Louis meeting. The clerical error by which the date was made the 20th, instead of the 27th instant, originating in the Official Bulletin, was no sooner corrected there than it slipped into the editorial column. Postal cards were sent two weeks ago to all members, to correct the mistake ; and we trust that no one has been seriously misled. We do not dare (in view of past experience) to attempt to repeat the date here ; but we venture to say, this week, with proud consciousness of accuracy, LOOK AT THE BULLETIN !

Let all who propose to attend the meeting try to get on the train which leaves New York at 5 P. M., and Philadelphia at 8:20 P. M., on Monday. The trip to St. Louis, which might be tedious to solitary travellers, will become, when enlivened by good company, not the least enjoyable feature incidental to the meeting. We regret to say that the officials of the several trunk lines to the West regret to say that, in consequence of an agreement among the lines, no reduction of fares can be made. Members will doubtless add their regrets to those which all parties appear to experience on this sad occasion. But there never has been a meeting yet which was not "worth the whole cost of the journey" (as the gentleman from Dunbar has frequently remarked) ; and we advise members to stand the expense, and charge it to their next client, particularly if the client happens to be a railroad company.

THE Ways and Means Committee of the House has reported against restoring the 10 per cent. duty which was removed from iron and a large number of other imports, by the Act of June 2, 1872. The restoration would have increased the tariff revenue of the Government about $8,000,000 a year, but the Committee did not think such increase necessary. The measure, as our readers know, has been stoutly advocated by some members of the iron trades, and for several weeks the Committee has taken testimony on the subject. What its feeling is as to the question of protection we do not know, but as it voted 8 to 2 against the measure, we suppose the members thought that the iron manufacturers do not need protection, or else that an addition of about 70 cents a ton to the cwt. of imported iron, at a time when imports are really insignificant, and the foreign article is higher than the home, would be futile.

THE *American Manufacturer's* monthly returns from blast furnaces show that 325 furnaces, with a weekly capacity of 51,799 tons, were in blast May 1, 1874, and that 197 furnaces, with a weekly capacity of 30,505 tons, were out of blast. These figures are interesting, but is not the capacity of the furnaces over-stated ? The total number heard from by our contemporary is 522 furnaces, capable of turning out 82,304 tons weekly, or nearly 4,300,000 tons a year. The number of stacks in this country is variously estimated at 666 to 750, so that the possible furnace capacity, according to these figures, would be at least five and a half million tons a year. The 522 furnaces reported as above average 8200 tons a year, which must be too great, for the average of furnaces in Great Britain in 1872 was 9600 tons, and the proportion of small stacks is very much greater in this country than there. The average in Scotland last year was only 8131 tons. According to the table given by the *Manufacturer*, the average daily make of furnaces in different parts of the country is as follows : W. Va., 39 tons ; Pa., 26 tons ; Ohio and Ky., 25 tons ; Ala., 17 tons ; Ga., 12 tons ; Va., 6½ tons, etc. Some of these are evidently wide of the truth, and we do not see that the "monthly returns," as presented, offer a just means of ascertaining the true make of the country.

## The Pennsylvania Survey.

WE rejoice to learn that the bill for a new geological survey of Pennsylvania has passed both houses of the State Legislature and received the signature of the Governor. It appropriates $35,000 per annum for three years, and confides the appointment of the State geologist, with other matters, to a board of ten commissioners, besides the Governor, who is ex-officio president. The following are the names of the commissioners : ARIO PARDEE, Hazelton ; WM. A. INGHAM, Philadelphia ; HENRY S. ECHERT, Reading ; HENRY MCCORMICK, Harrisburg ; JAMES MACFARLANE, Towanda ; JOHN B. PEARCE, Philadelphia ; ROBERT B. NITSON, Clearfield ; DANIEL J. MORRELL, Johnstown ; HENRY W. OLIVER, Pittsburg ; S. Q. BROWN, Venango Co. The names of these gentlemen afford a satisfactory guaranty that the duty entrusted to them will be conscientiously and intelligently performed. So far as the selection of a State geologist is concerned, their task will be easy. Professor J. P. LESLEY is so generally acknowledged to be the right man for the place, that his appointment will be but the formal recognition and record of an overwhelming public sentiment in his favor. We congratulate the citizens of Pennsylvania that this great work has been taken up at a time when a great scientific worker, specially qualified for it and interested in it, is at hand to direct its execution.

## The Mill River Calamity.

WHEN a dam breaks under the ordinary conditions of its service, and with no freshet or other special occurrence as the cause of the disaster, it is pretty safe to say that somebody was to blame. From the engineer who designed the work, down to the watchman who guarded it, there is a line of persons whose responsibility ought to be carefully looked into.

Such is the position of some dozen or two persons in regard to the dreadful disaster which ruined three manufacturing towns in Massachusetts in a few minutes last Saturday morning. A dam intended to hold water of 30 or 40 feet depth suddenly gave way, and the huge wave produced manifested all the destructive force of water under such circumstances. About 150 lives and $1,000,000 worth of property represent the loss incurred.

We have looked in vain through the voluminous reports of the daily papers for a respectable account of the dam's construction. Very different dimensions are assigned the dam wall and embankment by different reporters. The last account says the wall was 8 ft. thick at the bottom, and 2 ft. at the top, rising 42 ft. above the bed of the stream. This had an embankment which, on the water side, had an angle of 30°, and on the front of the wall 45°. Its base was 120 ft. It is also reported that, when the Legislative Committee visited the scene with the contractor, it was proved that no excavation had been made for the foundation which had been laid on surface earth, and also that the embankment was 40 ft. narrower than the contract called for. We hesitate to republish these statements for they are given by reporters who have proved themselves incapable of dealing properly with the subject, but very capable of misrepresenting it. Still they form all the evidence there is in the case, and until the authorities look carefully into the matter, they may stand for what they are worth. This testimony throws the blame on the contractors, and in presenting it in advance of a trustworthy inquiry we do so without prejudice to them, and only to lay in a concise form what information there is on the subject before our readers.

We are pleased to learn that the American Society of Civil Engineers has appointed a committee of three to ascertain the cause of this disaster. This Committee is Messrs. FRANCIS, of Lowell ; WORTHEN, of New York, and General T. G. ELLIS.

## Refining for American Lead.

WE showed a few weeks ago that there has been a positive decline in the standing of American brands of lead compared with foreign brands. Where we were once leaders we no longer even compete. The cause of this change, as our former article pointed out, is not due to a deterioration of American metal, for we still make considerable quantities of lead from the same ores, by the same processes, and of the same quality as in old times. The difficulty is, that while our lead smelters have been stationary, the rest of the world has moved on, and at a rapid pace. We also pointed out that it is quite possible to make lead from the Mississippi Valley ores, which will be equal in quality to any made in the world, and that the only doubt is one of profit. Further than that an editor cannot go. The question of whether such refining processes are applicable, is strictly a local question, and is to be solved only by a discussion of items which are both too minute and too private for presentation in a public journal.

As remarked in our former article, the latest improvements in lead refining have been introduced in one form or another in American works Western

brands of lead are too impure for any use whatever without refining, and as their principal value is in silver, which is removed by refining processes of the very same character as those which have so completely revolutionized the metallurgy of this metal in other countries, it may be worth while to see why it is that, with the same methods, the American product is less pure than the foreign. It is not that our "work lead," or lead *bullion* as it is called here, is still more impure than the foreign. That is probably the case, but if a lead which is *almost* good enough to serve for corroding, can be made from the crude western metal, it is plain that a repetition of the refining process would remove the last traces of impurity. In point of fact, a good quality of metal has been made from the very impure western lead, and it has been used with flattering results by the white lead makers of the Atlantic coast, where only the very best brands can be employed. The trouble is that this quality was not sustained. The paint manufacturers find that though occasional lots are exceptionally good, the ordinary run of the metal produced in the "separating works," East and West, is not up to the required standard. At all events, their lots of lead are very uneven, and irregularity is in itself enough to prevent the use of American refined lead for corroding. It is worth while to inquire whether this defect cannot be removed.

It may seem at the first glance that this fault is one which a little experience will cure, but that is not so certain. The foreign establishments which produce the best brands work steadily on ore from one mine or one system of mines. Long habit has taught the workmen just how to treat their material, and the furnace work proceeds with a regularity that is probably unknown in our own establishments. The latter work under precisely the opposite conditions. It is true that Western furnaces are usually built in connection with some one mine or series of mines, but nearly all of them buy ores. Little or no care is taken to maintain a regular composition of the charge. The smelter knows next to nothing of what goes into his furnace or what comes out. When we turn to the refining or "separating" works the difficulty increases. They are entirely unconnected with the smelting works, and are usually in other hands. The lead they separate is bought in the open market, and they know nothing either of the works or of the mines which produced it. The material they treat varies with every lot of metal they buy. Uniformity of product is consequently impossible, and indeed it is rare to find a refiner who cares to organize his processes so as to carry the purity of his product beyond that required for rollers or founders. When the attempt is made the diversity in the raw material is such as to prevent uniformity in the product.

We have taken up this subject because we believe that American refiners will before long have to abandon the indifference, or perhaps we should say, the *despair*, with which they seem to regard the necessity which purchasers are under of going abroad when lead of the best quality is wanted. After a period of inaction lead mining in this country has started into life again, not only in the Territories but also in the States. It is undoubtedly destined to experience a great and rapid development, the effect of which may possibly recall the disasters which a similar occurrence brought upon dealers in lead half a century ago, when the discovery of the rich mines in Spain threw such quantities of metal suddenly upon the market. The United States are heavy consumers of lead, but 30 per cent. of what they use comes from abroad for the sole purpose of making the best quality of paint. If the production of the common grades continues to increase, as it is most likely to do, our refiners will be forced to make an effort for the occupation of the higher field too.

Can this be successfully accomplished? That question must be answered in the affirmative, with the provision that ordinary metal must first sink to such a price as will afford the refiner a margin for his operations. We pointed out in our former article that this country produces 15,000 tons of excellent virgin lead annually, and that this, by refining, can undoubtedly be brought up to a quality which will satisfy the demands of the most critical Eastern manufacturer of white lead. Just what margin is required to make refining possible, it is impossible to say, but as it is quite probable that blowing with steam without addition of zinc, or careful liquation with blowing or poling, would answer, it may be that even at the present margin of ¼–⅜ cents per pound, the lead smelter might find it advantageous to refine. At all events, refiners who have works already in operation can settle the question for Missouri lead almost without risk. In fact, we are quite certain that Missouri lead could be refined and corroded at home at a cost which would make its manufacture profitable.

But this, it may be said, would take away the present second quality of white lead, which is now made from the lead which we have just proposed to refine to a higher grade. Something must be found to take its place, and for that we still have the Western lead, which even by the present methods of treatment is often refined to a quality about equal to the crude Missouri and Galena metal. In spite of the difficulties which lack of uniformity brings upon the refiner, we do not doubt that a system could be devised which should give a metal of as good quality as that now corroded in the Western States.

What we have suggested amounts to just this:—finding ourselves surpassed by our European rivals, let us adopt the same general system that they use. Let us refine our best as well as our worst brands, making the whole line take one step upward. That successfully accomplished, we shall be able to supply both Western and Eastern paint factories. The market will be strengthened just at a juncture when it most needs backbone. That this course is a possible one we do not doubt. It may not be possible to work it out in a week or a year, but in our view it is an absolute certainty for the future, and the present is not too soon to set about it.

## The British Iron and Steel Institute.—Mr. Bell's Address.

IN another column our special correspondent, Prof. MAYNARD, describes the opening session of the meeting of the British Iron and Steel Institute, at London, on the 6th inst. We regret that we are unable to publish in full the address of Mr I. LOWTHIAN BELL, the President of the Institute. Of course it is interesting and suggestive, as are all the utterances of this distinguished iron-master. We must confess, however, we do not find it quite equal to some which have preceded it. Mr. BELL labors this year under the disadvantage of having little that is new to say.

The address commences with a complimentary allusion to the Belgians, and their reception of the Institute at Liege. The subject of DANKS' furnace is then taken up, and it is intimated that the success of the apparatus in England has not corresponded with the accounts given by the English Committee sent to this country to examine it. Mr. BELL states over again the arguments *pro* and *con*, with which we are all familiar, and invites fresh information. His allusion to Dr. SIEMENS' manufacture of iron and steel by direct processes, seems to be a repetition of the arguments formerly used by him, in the debate on SIEMENS' paper. He still declines to grant the claim of the latter, with respect to economy of fuel. The important result achieved at the works at Terrenoire (in Southern France), where steel is successfully manufactured from material containing between 0.3 and 0.4 per cent. of phosphorus, by the simple expedient of reducing the quantity of carbon in proportion to the increase of phosphorus, receives a passing and non-committal notice from Mr. BELL. He devotes considerable space to the subject of additional temperature in the blast used in iron smelting, and reiterates his conviction, based on experiments at Cleveland, that the only commercial advantage gained by the previous heating of the air, for furnaces sufficiently capacious, must result from the use of cheaper fuel outside of the furnace than can be employed inside. In connection with this subject, he notices the paper by Prof. TUNNER, criticising his views on the chemical re-actions of the blast-furnace, and suggests, as an explanation of the remarkably high percentage of the carbonic acid in the gases escaping from certain German charcoal furnaces, that the larger quantity of potash contained in charcoal, as compared with coke, gives rise to the formation of a larger amount of cyanogen, which, according to experiments made by Mr. BELL, assists the "splitting-up" of carbonic oxide into carbonic acid, or, in other words, the reduction of iron oxide and the deposition of carbon. The argument is somewhat obscure, and the cause does not seem to us adequate to explain the facts of economy in the use of fuel cited by Prof. TUNNER.

Mr. BELL concludes by expressing the belief that the difficulties at present besetting the English iron manufacture are but temporary in character, and that the abundance of raw material and of manufacturing skill will enable British energy "to hold its own against any people in the world." It is chiefly, however, with regard to European competition that he is so confident. So acute an observer cannot fail to perceive that the great rival of Great Britain in the iron manufacture of the future will be the United States.

## CORRESPONDENCE.

### Phosphorus in Bessemer Pig.

TO THE EDITOR,—SIR: Will you please give in the *Journal* an analysis of the kind of pig iron desired by the Bessemer steel makers, and state also the largest amount of silicon, phosphoric and sulphuric acids, which an iron can contain, and still be suitable for use in the converter. I have seen a great many articles about the necessary qualities of a Bessemer pig iron, but nothing which I thought definite, and as a pig-iron maker who hopes to make something for such use, I would like to know more about it. Perhaps Mr. HOLLEY would be willing to give us all some information on the subject.

MAY 8, 1874. Yours truly, JAS. C. PLATT, JR.

In the books it has long been stated that the maximum percentage of phosphorus allowable in pig iron designed for the Bessemer process, is 0.02 per cent., but as pig metal of this purity is extremely rare, and as the world does not produce as much of it as it makes of Bessemer steel, it is a self-evident fact that less spotless brands of iron must be used. We have therefore on one hand the theoretical maximum of 0.02 per cent. of phosphorus; and, on the other hand, a practical maximum which may be placed at not far from 0.12 per cent. We believe that steel has been made from iron containing 0.17 per cent., and lately steel was experimentally made by the Siemens-Martin process which contained 0.30 per cent. of phosphorus.

We give these figures not to answer our correspondent's letter, for we prefer our readers to do that; but we offer them rather as a standard which can be consented to, or dissented from, by steel makers, and we would like to hear from them what percentage of phosphorus they have found Bessemer steel to bear.

### Coal Mining in Iowa.

COUNCIL BLUFFS, May 14th, 1874.

TO THE EDITOR—SIR: While I notice, in your valuable and welcome Journal, frequent communications from adjoining States, I see little from this one of ours on the subject of coal, and having been engaged in prospecting and coal mining since the first car-load was shipped I will endeavor to fill up the gap with a few notes on this region.

The first coal mine was opened in the Des Moines Valley, and though coal has been opened successfully in other parts of the State, the greatest developments have been made there. But little mining has been done except along the outcrop

of the veins above water-level. One year ago, I put down a test shaft in Monroe County, 30 miles from the Des Moines Valley, to the depth of 130 feet, and found a fine bed of coal, 6 feet thick, but not the same, I believe, as that worked in the valley; I have now the working shaft a quarter of a mile apart and connected by gangways. We have no water at all, and consequently require no pump. The roof is good, and we have by far the best mine in the State.

At one of the pits we have a double cylinder link-motion engine, of thirty horse power; it is supplied with steam from a double flue boiler 18 feet long, 42 inches diameter; the flues are 14 inches diameter. The engine is connected with the winding drum by gearing, and we lift from the shaft, which has a double hoistway, by a 1⅛ inch wire rope passing over a 6 feet sheave, at the head of the shaft. We raise one ton of coal each trip, and this is done in 30 seconds.

We work by the chamber and pillar system, and ventilate with a furnace near the foot of the shaft, a portion of which is divided off as an upcast, the hoistways being the downcasts. Our working capacity is about 250 tons per day, though we are now mining but 150 tons daily, for it is the dull season with us. On another occasion, I shall give you further particulars of what we are doing out here, if you desire it. Yours, &c., J. W. RODEFER.

[We shall be glad to hear further from our correspondent; who will perhaps favor us with the rates of wages paid for different kinds of work, cost of living, cost of mining supplies and such other practical items as may suggest themselves.—ED.]

## Iron and Steel Institute.

LONDON, May 6, 1874.

TO THE EDITOR,—SIR: At eleven o'clock this morning, the first session of the Iron and Steel Institute was convened at the rooms of the Institute of Civil Engineers, on Great George street, Westminster.

ISAAC LOWTHIAN BELL, M. P., was in the chair, at his side sat the former president, Mr. BESSEMER. The fine hall of the Institute was well filled. Many of the men eminent in English iron metallurgy were present. Those that I recognized were SIEMENS, MENALAUS, WHITWELL, COWPER, SNELUS, RILEY, HEATH, SMITH, of Barrow, BROGDEN, and FORBES, the eminent foreign secretary.

The proceedings were opened with the report of the Council read by Mr JOHN JONES, the Secretary. The total number of voting members is now 708, being an increase of 134 over last year.

The Institute has, after mature deliberation, concluded to elect honorary members, the number to be limited to *twenty*. The president very gracefully alluded to the cordial reception tendered the Institute in Belgium, in August last, and stated that the Council had concluded to nominate the King of Belgium as the first honorary member. The meeting unanimously confirmed the nomination.

At the last annual meeting Mr. BESSEMER announced that he had invested four hundred pounds in behalf of the Institute, the interest of which should be applied to the purchase of a gold medal, to be conferred annually upon him who, in the opinion of the Council, shall have invented or introduced the most valuable mechanical or chemical process; or, secondly, shall have presented the best paper at a session of the Institute; or, thirdly, contributed the most valuable article to the Journal.

The medal may be awarded to members or non-members, of any nationality.

After a vote of thanks to Mr. BESSEMER for his munificence, he arose and in few appropriate words presented the medal to Mr. I. LOWTHIAN BELL. The medal is a very heavy one, having on one side the profile of Mr. BESSEMER, with the words "HENRY BESSEMER" around it, and on the other side "Iron and Steel Institute," and a space for an inscription. Mr. BELL in reply said that he considered it the highest honor that could possibly be conferred upon him.

The president then followed with his address.

The discussion was opened by Mr. JNO. A. JONES, managing director of the Eremus Works, near Middlesbro', on the success of the Danks furnace. He confessed that the results at his works did not correspond with the observations made by the committee in America. The three principal difficulties which he has had to contend with have been the "want of handiness" on the part of the men. 2d, the difficulty of getting the fettling to stand; and, thirdly, the *mechanical* defects in the machine itself.

In America they work only single shifts, while in England the effort has always been to work double shifts. Mr. JONES said that neither fettling nor pig iron should be put in cold, and that when he had introduced both in a molten condition he had worked through 10 heats in 12 hours, being a total production of 5 tons, 10 cwt., in one furnace. The amount of fuel used—and the smallest amount—has been 12½ cwt., but this does not include the coal for melting the pig and fettling. The largest yield has been 21 cwt. of bars from 20 cwt. pig iron.

Mr. JONES stated that not *one* part but every part of the furnace had broken down at some time; still he expressed the firm belief that in 6 months all these mechanical difficulties would be overcome. He never considered the Danks as a "*rotary finality*." He regarded Crampton's furnace infinitely better in the matter of firing and mechanical construction. The efficiency of the furnace is greatly increased by a partial refining of the pig before introduction, and this is accomplished by simply melting in a cupola with pure oxide of iron, whereby the silicon and phosphorus are very much lessened, and the refined pig contains 95 per cent. metallic iron. After this refining the deterioration of the lining is not nearly as rapid. The simple melting of the pig does not produce so good a result. Originally it required two hours to fettle, but now only 15 minutes.

Mr. WILSON, chairman of HOPKINS, GILES & Co., exhibited sections of rails which spoke for themselves, as to the excellence of the Danks iron. They had had the same mechanical difficulties mentioned by Mr. JONES.

Mr. HEATH, on the contrary, testified that the Danks furnace was a perfect success as a mechanical pudler; the only difficulty he had to contend with was the handling of the large balls, and that he had not obtained as good results as he could wish in boiler plates, they turning out "spilly," as he expressed it. With a better constructed squeezer he expected to overcome all difficulties.

Mr. CRAMPTON stated, in reference to his furnace, that his effort had been to get the highest temperature without an oxydizing flame and the introduction of dust. He claims to get rid of *all* the phosphorus and sulphur. In three hours from the time of firing up over 9 cwt. of iron is obtained, with a consumption of 7 cwt. of coal in firing. By melting the pig beforehand 14 cwt. may be obtained.

Some remarkable examples of tested iron were exhibited, the one which had been submitted to the severest tests was made from pig containing 1·3 per cent. phosphorus, the finished iron having only a trace.

In six minutes a charge can be drawn, the furnace refettled and recharged, and the fettling is done cold with old cinder.

Mr. BRIGGS, director of the North of England Industrial Iron Co., fully indorsed Mr. CRAMPTON. He stated that there was a gain of 14 per cent. on the pig iron introduced, and the puddled bar made from Middlesbro' pig was superior to the very best Yorkshire.

The further discussion of Mr. BELL's address will appear in my next letter.

GEO. W. MAYNARD.

## The Trial of Rock Drills at Port Henry.

WE gave last week a partial summary of the results obtained at this trial. Below will be found some others, taken also from Mr. REYNOLDS' pamphlet. A dry hole was run with ordinary drill points (not extra sharp), in which the performance was:

| | Rand. | Waring. | Ingersoll. |
|---|---|---|---|
| Time drilling | 46m. 45s. | 29m. 15s. | 67m. |
| Depth of hole | 4 ft. 9 in. | 5 ft. | 4 ft. 9½ in. |
| Diameter of hole top | 1⅞ in. | 1⅞ in. | 1⅞ in. |
| Diameter of hole bottom | 1½ in. | 1½ in. | 1½ in. |
| Number of drills used | 4 | 4 | 4 |

We cannot refrain from criticising the manner in which the report on these trials is made up. In the last table, (of the Ingersoll drill,) tor instance, is the *mem.*, "lost time while blasting, 5 minutes," but whether this is to be deducted from the time of drilling, or whether it has already been deducted, the report does not say. This and other defects unfortunately mar what would otherwise be a valuable document.

## The Magnetic Iron Ores of New Jersey—Their Geographical Distribution and Geological Occurrence.

BY PROF. J. C. SMOCK.

CONTINUED FROM PAGE 306.

Discussion on Prof. SMOCK's paper, read before the American Institute of Mining Engineers, New York, February 26, 1874.

Mr. HEINRICH said that shoots were formerly supposed to be produced by horses, but he considered that opinion erroneous. In the old country they were more correctly called *ore falls*. They are found in many mines, for instance the Gold Hill, N. C., mines, and lead mine, Whitefield, Va. They are zones occurring successively on the line of pitch, and carrying large amounts of ore. The old German miners had the true idea when they called such occurrences "Adlers Vorschub," meaning a richer part of the vein which has been carried forward. They occur in all kinds of ore and rock.

Dr. STERRY HUNT stated that the observations of Prof. SMOCK on the occurrence of magnetite agreed precisely with his own in the Laurentian rocks of the Adirondacks and the Laurentides. He believed that its present distribution was dependent upon the original accumulation of iron-oxyd, as it was thrown down with the elements which now make up the quartzite, gneiss and limestone, with all of which rocks the ore beds are associated, and into which they pass by insensible gradations in intermixture. His views on the subject will be found in the lately published volume of Transactions of the Institute of Mining Engineers, pages 334 and 370.

The pitch, as it is called, of the elongated masses of interstratified ore, described by Prof. SMOCK, which corresponds neither with the dip nor the strike of the anticlinal axes, Dr. HUNT would explain by supposing that the ore was originally deposited in this region in elongated parallel streaks or patches, and that the subsequent undulations of the strata did not coincide with these, but differed from them, for example, 25° or 30°. Such being the case, and the strata being raised to a high angle with a north and south strike, the streaks of ore would be found to pitch on the one side of the axis to the northeast, and on the other to the southwest.

He conceived at the same time, that where there was not a great divergence between the strike of the deposits and that of the folds, the movements of the strata would cause the layers of ore, if more plastic, to be partially displaced, thickened in some places and thinned out in others. The limestones of the Laurentian series present clear evidences of their former softened and plastic condition in the internal movements which have distorted them and their thin enclosed quartzite layers, showing the limestone masses to have been irregularly

compressed and displaced by the movements of the more rigid enclosing gneissic strata. He thought it not improbable that the iron ore beds had been affected in a similar manner. Something analogous to this seems to occur in the thickened and rolled-up coal-beds which are described as occurring in some parts of East Tennessee. The speaker, who had examined some of these New Jersey magnetite deposits, threw out these views as suggestions which appear to him most in accordance with the facts known to him, and invited the attention of observers who might either confirm them or disprove them, and substitute in their stead some other explanations more in accordance with the results of a wider observation.

Prof. WM. P. BLAKE, spoke of the fidelity of observation and accuracy of description shown by the paper just presented in relation to the deposits of iron ore in New Jersey. In regard to the peculiar elongated form of the deposits, he had been greatly interested, and was reminded of Mr. HEINRICH'S recent remarks on the local concentration of metalliferous minerals in veins. Phenomena of this kind have a wide range. Local longitudinal accumulation, vertically or inclined, is common in all veins. Evidently there is a common cause, some law not yet known but which may some day be discovered, explaining this longitudinal accumulation of ores. As for the New Jersey iron ore beds, the speaker saw in their form and distribution in the rocks evidences of their detrital origin. He regarded them as of mechanical rather than chemical origin. They were laid down under water, but he could not accept the theory that the water was always in a quiet state.

In a rushing current of water the heavy minerals are collected by themselves at the bottom, and the lighter ones are separated from them, a principle that is in common use for the artificial enrichment of metalliferous ores. If we imagine a rapid and narrow stream running through a country in which ferruginous rocks abounded, the iron minerals swept down the stream would be concentrated in long and irregular patches, precisely as we find existing streams sorting out the common and iron sand they carry along. These patches would naturally be connected by threads of similar ores, and the general line of the deposit would evidently be that of the river bed or current which formed them. These were probably the conditions in New Jersey. A series of rivers running down to the sea, or some great body of water in tidal currents, performed the concentration in parallel lines like the streaks of iron sand we find at this day. On the other hand, if we assume quiet deposition in previously formed valleys, we must believe the deposition to have been simultaneous throughout the whole district. How could valleys be so long and deep compared with their breadth as these beds are? They would almost be straight lines. Then, too, there must have been a constant recurrence of such valleys throughout the successive geological horizons, for Prof. SMOCK shows that the beds are not confined to any one stratum, but are found in several and of all grades of size and richness. The evidence is that they were formed mechanically of materials swept along by currents. The nature of the strata indicates this; and he was forced to consider the beds as the debris of older deposits broken up, concentrated by nature, redeposited, and subsequently metamorphosed.

## The Pig-iron Interests.

Mr. CHARLES J. NOURSE, Chairman of the Pig-iron Committee of the American Iron and Steel Association, has called a meeting of the pig-iron manufacturers for Thursday morning, the 28th inst., at the Association rooms, 265 South 4th street Philadelphia, to consider the continued depression in the iron trade. It is expected that the meeting will urge decisive action by Congress on the financial question, and on the proposition to restore the ten per cent. duty taken off by the act of 1872. The call has been approved by the leading iron manufacturers.

## COAL TRADE REVIEW.

### Import Duty on Coal.

*Anthracite* free. *Bituminous*, per ton of 28 bushels, 80 lb. to the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c. gold.

NEW YORK, May 22, 1874.

**The Production of Anthracite Coal** for the week ending May 16th, 1874, was as follows:

| | WEEK. Tons. | YEAR* Tons. |
|---|---|---|
| *Wyoming Region.* | | |
| Delaware and Hudson Canal Co | 58,097 | 892,709 |
| Delaware, Lackawanna and Western R.R | 57,729 | 911,664 |
| Pennsylvania Coal Co | 28,242 | 424,337 |
| Lehigh Valley R.R. | 23,919 | 379,435 |
| Pennsylvania and New York R.R | 1,563 | 26,522 |
| Central Railroad of New Jersey | 29,677 | 436,056 |
| | 199,221 | 3,061,723 |
| *Lehigh Region.* | | |
| Lehigh Valley R.R | 63,898 | 1,080,233 |
| Central Railroad of New Jersey | 27,953 | 327,846 |
| †Danville, Hazleton & W. B. R.R. | .... | 6,358 |
| | 91,851 | 1,414,437 |
| *Schuylkill Region* | | |
| Philadelphia and Reading R.R | 120,047 | 1,607,970 |
| Shamokin and Lykens Valley | 22,395 | 239,293 |
| | 142,442 | 1,847,263 |
| *Sullivan Region.* | | |
| Sullivan and Erie R.R | 775 | 10,521 |
| Total of all the regions | 434,289 | 6,333,944 |

* Year beginning Jan. 1.
† From the Penn. R.R. Co.'s report, May 9.

**The Production of Bituminous Coal** for the week ending May 16th, was as follows:

| | Week. Tons. | Year. Tons. |
|---|---|---|
| Cumberland and Pennsylvania R.R. | 51,805 | 595 999 |
| Cumberland Branch R.R. | 3,462 | 61,935 |
| Barclay R.R. | 7,629 | 80,840 |
| Huntingdon & Broad Top R.R. | 4,998 | 88,881 |
| † Snow Shoe | .... | 25,062 |
| † Tyrone and Clearfield | .... | 216,642 |
| † Allegheny Region, Penn. R.R. | .... | 88,312 |
| † West Penn. R.R. | .... | 80.744 |
| † Southwest Penn. R.R. | .... | 1.563 |
| † Gas Coal, Penn. R.R. | .... | 290,687 |
| † Pittsburgh Coal, Penn. R.R. | .... | 139,872 |
| **Coke.** | | |
| † Tyrone and Clearfield | .... | 149 |
| † Allegheny Region, Penn. R.R. | .... | 46 |
| † West Penn. R.R. | .... | 22,004 |
| † Southwest Penn. R.R. | .... | 143 344 |
| † Gas Coal, Penn. R.R. | .... | 15,120 |
| † Pittsburgh Coal, Penn. R.R. | .... | 32,488 |

† From Penn. R.R. Co's report for the week ending May 2nd.

### Chesapeake and Ohio Railroad.

Coal received from mines for week ending May 9, 1874:

| | TONS. |
|---|---|
| Cannel Coal | 450 |
| Splint " | 2,090 |
| Bituminous Coal | 95 |
| Total | 2,635 |

Our table of anthracite production gives for the week 434,289 tons, as against 467,212 tons for the previous week, and 443,528 tons for the corresponding week last year. The total production for the year is 6,333,944 tons, as against 6,035,815 tons for the corresponding period of 1873. These figures show a decrease for the week, this year, of 9,239 tons, and an increase for the year of 298,129 tons. The figures of last year we take from the Pottsville *Miner's Journal*.

The receipts at Port Richmond, for the week, are reported at 55,000 tons; shipments 50,000; and balance on hand 107,000 tons.

The receipts, for shipment, at Coal Port for the week were 9.908 tons and the shipments 9,946 tons. The receipts at South Amboy were 6,339 tons and the shipments 13,167 tons. The total receipts at these ports, since January 1st, were 336,515 tons, and the shipments 283,616 tons, showing an accumulation of 52,899 tons since that date.

The Delaware and Hudson Canal Company has in stock at Honesdale 475 000 tons; at Rondout 55,000 tons, and at Weehawken 16,000 tons.

The production of Cumberland coal from January 1st to May 16th was 657,933 tons, as compared with 737,343 tons for the corresponding time last year. The production for the week was 54,304 tons. as compared with 54,473 tons for the previous week.

We are just in receipt of the following circular from the Philadelphia & Reading Railroad Co.:

PHILADELPHIA, May 22, 1874.

"Hereafter where any shipper has more than one colliery, his entire daily allotment of cars for all may be sent to any one or more collieries as he may direct.

"FRANKLIN B. GOWEN, President."

### New York Coal Trade.

*Anthracite.*—There is little change to note in the market for the past week, the larger companies claiming a ready sale in some instances, but the outside dealers repeating the "very dull," "no life in it," "could'nt be worse," etc., with which we have become so familiar during the past five months. There is a considerable movement of coal under season contracts, because vessels are abundant and freights exceedingly low, and the new orders coming in would indicate a partial revival of manufacturing; but the iron business evinces no sign of revival as yet, and business generally is being done on a much smaller scale, and with closer margins than is usual, and this general dullness reacts on the anthracite trade, though prices are maintained by the companies at the standard required by the programme, and for June it has even been decided to increase the price of stove coal 15 cents per ton instead of *ten* as is the case with other sizes. This is to equalize the demand for the different sizes as there is so large an amount of certain sizes now on hand that some of the companies have no room to stock any more. Our Philadelphia report states that the Reading Company at all its stocking sheds and wharves at that place has probably 250,000 tons now on hand. The Delaware and Hudson has 475,000 at Honesdale; 55,000 at Rondout, and 16,000 at Weehawken, and there are besides large stocks at Boston and nearly all the other large markets. We were therefore prepared for the announced reduction of 20 per cent. from the amount allowed by the combination to come to competitive points during the month of June.

The Delaware, Lackawanna and Western Company advertise their usual monthly sale in another column; 50,000 tons will be offered, and the price will doubtless be about the same as the June prices. In order that the proposed prices may be more convenient for reference, we publish this week, and will keep standing, the following table:

*Programme Prices of Schuylkill, Lackawanna, Wilkes-Barre and Lehigh Coals at the New York Shipping Ports.*

| 1874. | | Lump. | | Stv'nr. | | Grate or broken. | | Egg. | | Stove. | | Chestnut. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| March | | 4.55 | 5.35 | 4.65 | 5.30 | 4.75 | 5.30 | 4.90 | 5.30 | 5.35 | 5.45 | 4.35 | 4.50 |
| April | | 4.60 | 5.40 | 4.70 | 5.35 | 4.80 | 5.35 | 4.95 | 5.35 | 5.40 | 5.50 | 4.40 | 4.55 |
| May | | 4.70 | 5.50 | 4.80 | 5.45 | 4.90 | 5.45 | 5.05 | 5.45 | 5.50 | 5.60 | 4.50 | 4.65 |
| June | | 4.80 | 5.60 | 4.90 | 5.55 | 5.00 | 5.55 | 5.15 | 5.55 | 5.65 | 5.70 | 4.60 | 4.75 |
| July | | 4.95 | 5.75 | 5.05 | 5.70 | 5.15 | 5.70 | 5.30 | 5.70 | 5.75 | 5.85 | 4.75 | 4.90 |
| August | | 5.10 | 5.90 | 5.20 | 5.85 | 5.30 | 5.85 | 5.45 | 5.85 | 5.90 | 6.00 | 4.90 | 5.05 |
| September | | 5.25 | 6.05 | 5.35 | 6.00 | 5.45 | 6.00 | 5.60 | 6.00 | 6.05 | 6.15 | 5.05 | 5.20 |
| October | | 5.40 | 6.20 | 5.50 | 6.15 | 5.60 | 6.15 | 5.75 | 6.15 | 6.20 | 6.30 | 5.20 | 5.35 |
| November | | 5.55 | 6.35 | 5.65 | 6.30 | 5.75 | 6.30 | 5.90 | 6.30 | 6.35 | 6.45 | 5.35 | 5.50 |
| Average, 1874 | | 4.99 | 5.79 | 5.09 | 5.74 | 5.09 | 5.74 | 5.34 | 5.74 | 5.79 | 5.99 | 4.79 | 4.94 |
| Prices on season contracts, | | 4.70 | | 4.85 | | 4.90 | | 5.05 | | 5.50 | | 4.50 | |

According to the programme, stove coal for June would have been $5 60, but as already stated, the price has been fixed at $5 65. There is little doubt the programme will be carried out as given for the remaining months.

Lehigh coals have been advanced 10 cents per ton all round, there is, therefore, for June only 5 cents per ton difference between Lehigh and Wilkes-Barre stove coal.

The last week of the month will probably see a little more activity in this market, but the impression is that the demand for the next few months will be moderate.

### Line Prices for May, 1874.

WHOLESALE.

| AT | Lump and Broken. | Egg. | Stove. | Chestnut. | Pea. |
|---|---|---|---|---|---|
| Carbondale | 2 25 | 2 25 | 2 50 | 2 00 | 1 25 |
| Fair Haven, Vt | 5 50 | 5 50 | 5 95 | 5 45 | .... |
| Ithaca, N. Y | 4 40 | 4 40 | 4 85 | 4 35 | .... |
| Mauch Chunk, Lehigh coal | 3 35 | 3 35 | 3 60 | 3 10 | .... |
| " Newport coal | 2 25 | 2 25 | 3 50 | 3 00 | .... |
| " Wilkes B. coal | 3 50 | 3 50 | 3 70 | 3 20 | .... |
| Pittston Junction | 2 45 | 2 45 | 2 70 | 2 45 | .... |
| Port Carbon | 2 75 | 3 00 | 3 15 | 2 40 | 1 25 |
| Port Clinton | 2 91 | 3 09 | 3 19 | 2 44 | 1 44 |
| Schuylkill Haven | 2 83 | 2 98 | 3 08 | 2 33 | 1 33 |
| Scranton | 2 25 | 2 25 | 2 50 | .... | 1 25 |
| Wilkes-Barre | 2 25 | 2 25 | 2 50 | 2 00 | 1 25 |
| Waverly, N. Y | 4 00 | 4 00 | 4 40 | 4 15 | .... |
| Syracuse, N.Y. | 4 55 | 4 50 | 4 95 | 4 20 | .... |
| Oswego and Buffalo, N. Y. | 5 50 | 5 50 | 5 90 | 5 45 | .... |

Lehigh furnace lump remains at $3 25, without commission.

The following are the wholesale prices f. o. b. at the shipping ports:

| | Lump. | Steamer. | Grate. | Egg. | Stove. | Chestnut. |
|---|---|---|---|---|---|---|
| **Wyoming Coals.** | | | | | | |
| ‡Scranton at E'port & Hoboken | 4 80 | 4 90 | 5 00 | 5 15 | 5 65 | 4 60 |
| *Lackawanna | 4 80 | 4 90 | 5 00 | 5 15 | 5 65 | 4 60 |
| Pittston at Newburgh | 4 65 | 4 65 | 4 75 | 4 85 | 5 40 | 4 50 |
| Wilkesbarre at Port Johnston | 4 80 | 4 90 | 5 00 | 5 15 | 5 65 | 4 60 |
| Newport and Plymouth | .... | .... | 5 00 | 5 15 | 5 85 | 4 60 |
| Susquehanna Coal Co. at Amboy | 4 95 | 5 05 | 5 10 | 5 25 | 5 75 | 4 70 |
| Kingston at Hoboken | 4 80 | 4 90 | 5 00 | 5 15 | 5 65 | 4 60 |
| **Lehigh Coals.** | | | | | | |
| Old Company at Port Johnston | 5 75 | .... | 5 70 | 5 70 | 5 60. | 4 60 |
| Old Company's Room Run | 5 20 | .... | 5 20 | 5 25 | 5 85 | 4 90 |
| Sugar Loaf at Port Johnston | 5 75 | .... | 5 70 | 5 70 | 5 70 | 4 75 |
| Lehigh Coal Exchange | 5 60 | .... | 5 55 | 5 55 | 5 70 | 4 75 |
| Honey Brook at Elizabethport | 5 60 | .... | 5 55 | 5 55 | 5 70 | 4 65 |
| Spring Mt. C. Co. at Hoboken | 5 60 | 5 60 | 5 55 | 5 55 | 5 85 | 4 90 |
| Beaver Meadow at South Amboy | 5 75 | .... | 5 70 | 5 70 | 5 70 | 4 75 |
| McNeal at Port Johnston | 5 60 | 5 60 | 5 55 | 5 55 | 5 60 | 3 75 |
| **Schuylkill Coals at Port Richmond.** | | | | | | |
| Schuylkill white ash | 4 30 | 4 40 | 4 50 | 4 65 | 5 15 | 4 00 |
| Schuylkill red ash | ... | .... | 4 65 | 4 80 | 5 15 | 4 25 |
| Shamokin white and red ash | .... | .... | 4 75 | 5 10 | 5 15 | 4 00 |
| N. Franklin | .... | .... | 5 10 | 5 10 | 5 30 | 4 25 |
| Lorberry | .... | .... | 5 25 | 5 25 | 6 05 | 4 75 |
| Lykens Valley | .... | .... | .... | 6 00 | 5 85 | 4 70 |

* f. o. b. in New York Harbor.

† These prices are for registered contracts. Buyers not having contracts will be charged 15 cents per ton more than above prices.

Lehigh Pea is quoted at $3.95.

| | Per ton. |
|---|---|
| Freight from Hoboken and Wehawken to New York | 40c. |
| Freight from Elizabeth and Port Johnston, to New York | 45c. |
| Freight from South Amboy to New York | 50c. |
| " " Newburgh to New York | 65c. |
| " " Port Richmond, "Philadelphia" alongside | 95c. |
| " " Rondout to New York by boat or barges of the D. & H. Canal Co. "delivered" | 50c. |

Retail prices per 2000 lb. are as follows:

| | Grate and Egg. | Stove. | Chestnut. |
|---|---|---|---|
| Pittston coal, in yard | $5 90 | $6 10 | $5 30 |
| Delaware & Hudson, in yard | 6 25 | 6 50 | 5 75 |
| Scranton, in yard | 7 00 | 7 25 | 6 50 |
| Wilkes-Barre, delivered | 6 85 | 7 10 | 6 35 |
| Lehigh & Locust Mountain, del'v'd. | 7 25 | 7 75 | 6 75 |

***Bituminous.***—There has been no change in the bituminous market for the past week, and no transactions to record; the output from the Cumberland region is being somewhat reduced by the closing of collieries, as mentioned by us last week. In provincial coals we note the arrival of about 900 tons from Port Caledonia. The complete stagnation of the market may be inferred from the fact that no cargo could be found for a vessel from Sydney, C. B., to New York, at $2 per ton, which would bring the coal about $5 50 per ton laid down here.

Freights are everywhere exceedingly low; we note a small shipment, 314 tons, from Baltimore to St. Thomas, at $2 75.

The following are the

WHOLESALE PRICES. F. O. B.

| | | | |
|---|---|---|---|
| Broad Top | $6 25 | Block House | 6 00 |
| Derby | 6 50 | Ohio Caking | 10 00 |
| Kittaning | 6 50 | Ohio Cannel | 12 50 |
| Clearfield, Sterling | 6 50 | Lyonsdale Coal | 12 00 |
| George's Creek, Cumberland | 6 50@6 75 | James River Bit | 6 50 |
| West Virginia Gas. | 7 40@7 50 | " Carb | 9 00 |
| Peytona Cannel | 13 50 | *Cannelton Cannel | 12 50 |
| Penn. Gas | 7 50@7 65 | Liverpool Gas Cannel, ex ship | 15 00@15 50 |
| Westmoreland Gas. | 7 50@7 65 | " House | 18 00 |
| Sterling Cannel | 14 00 | ‡Newcastle Gas | 8 00 |
| " " del'v'd. | 16 00 | Red Bank Cannel | 9 00 |
| Caledonia | 6 00 | †Cannelton Splint | 8 00 |
| Waverly Co. Youghiog'y. | 7 50 | | |

Freight from Richmond, Va., to New York, $2 00@2 10.
* $11 f. o. b. at Richmond.
† 6 " "
‡ Delivered at wharf.

RETAIL PRICES.

Per ton of 2000 lb.

| | |
|---|---|
| Liverpool House Orrel, delivered | $20 00@22 00 |
| Liverpool House Cannel, delivered | ....@25 00 |
| American Block, delivered | 16 00@ .... |
| Straitsville Cannel | 16 00@ .... |

The following are the prices of provincial coals, f. o. b., at the shipping ports of the mines:

PRICES IN GOLD F.O.B. AT THE SHIPPING PORTS OF THE MINES.

| | Coarse. | Slack. | | Coarse. | Slack. |
|---|---|---|---|---|---|
| Block House | $2 25 | $1 25 | Sydney, Reserve mine | 2 60 | .... |
| Gowris | 2 00 | 1 50 | Lingan | 2 50 | .... |
| Pictou, Albion mine | 3 00 | 1 50 | Caledonia | 2 00 | 1 00 |
| Pictou, Vale m. | 3 00 | .... | Glace Bay | 2 00 | 1 00 |

Freights from Cape Breton to New York, $2 75.

## Coal Trade of Philadelphia.

Philadelphia, May 21st.

From our Special Correspondent.

***Anthracite.***—Trade duller and a continuation of low freights, is a true statement of the condition of this market. We still note the error in your report of coal at Port Richmond; last week, your official report gave stock on hand 112,000 with receipts of 55,000, and shipments of 50,000, yet there is stated to be on hand only 107,000 tons. These figures must be obtained by some peculiar system of arithmetic not generaly understood; as they are apt to mislead, would it not be better to omit them altogether? A personal inspection of the storing places, shows where the excess of coal goes. In addition to Port Richmond, where the stocks of the individual shippers are light, the sheds of the Philadelphia and Reading Company at Arch street and at the foot of the wire bridge, on the Schuylkill, each holding about 30,000 tons, are quite full. Windmill Island and Tasker street wharf, on the Delaware, are well filled up, and the first holds a very large amount of coal. The R. R. yards at Berks street, at Port Richmond and Germantown are also well filled. The aggregate stock at the above named points is certainly very little, if any, short of a quarter of a million tons.

The retail price of anthracite here by the P. & R. Coal & I. Co. is per ton of 2,240 lb.

| | In Yard. | Delivered. |
|---|---|---|
| Broken | $5 50 | $6 25 |
| Egg and Stone | 5 75 | 6 50 |
| Chestnut | 4 75 | 5 50 |

with a little shading off, to suit circumstances. Outside dealers charge usually from 50c. to $1 per ton more for family coal, having special brands that will command that difference in price. The price of companies' coal goes up 10 cents per ton, except on stove coal, which increases 15c. for June, according to programme, but it is believed that rates will remain as they have been at Port Carbon for city and line trade.

BITUMINOUS COAL AT PHILADELPHIA.

| | |
|---|---|
| Penn. and Westmoreland (Gas), f.o.b., Greenwich | 6 00 |
| Broad Top, (according to destination,) f. o. b., Port Richmond | 4 75@5 00 |
| Clearfield f. o. b. at Greenwich, according to destination | 4 75@5 00 |

BITUMINOUS AT AMBOY.

| | |
|---|---|
| Penn. and Westmoreland (Gas), f. o. b. | 6 25 |
| Clearfield and Broad Top | 6 25 |

BITUMINOUS RETAIL AT PHILADELPHIA.

$6 in yard, per 2240 lb., cartage fidded.

All bituminous coal shipped from wharves is sold per ton of 224c lb. Coal sold in the railroad cars is all per ton of 2000 lb., R. R. freights being so charged.

Clearfield and Broad Top coal may be quoted in cars at mines for coal trade at $1 25 per 2000 lb.

## Georgetown, D. C., and Alexandria, Va.

George's Creek and Cumberland f.o.b. $4 40@$4 55, wholesale.

## Baltimore, Md.

Reported by E. STABLER, Jr., coal merchant.

WHOLESALE PRICES.

| | afloat. | at depot. |
|---|---|---|
| *Wilkes-Barre, "Lee," or "Diamond,"* | | |
| Lump, steamboat or broken | $5 05@$5 10 | $5 60 |
| Egg | 5 45 | 5 90 |
| Stove | 5 57 | 5 90 |
| *Pittston and Plymouth.* | | |
| Lump, steamboat, and broken | .... | 5 35 |
| Egg and stove | .... | 5 65 |
| "Boston" (free burning,) all sizes | 5 45 | 5 65 |
| Shamokin, red or white ash, all sizes | 5 45@5 60 | 5 50@5 60 |
| Lykens Valley, red ash, all sizes | 5 59 | 5 80 |

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per ton of 2240 lb. $7@8 00.

BITUMINOUS.

| | |
|---|---|
| George's Creek and Cumberland f. o. b. at Locust Point for cargoes | 4 60@4 85 |
| West Va. Gas Coal f. o. b. at Locust Point | 5 50@.... |
| Kanawha Cannel, coarse | 13 00@.... |
| Tyrone | 7 25@.... |
| Ritchie Mineral of West Virginia | 1 00@.... |

## Boston, Mass.

May 20, 1874.

Trade is very quiet. Prices unchanged.

CARGO PRICES TO TRADE.

| | | | |
|---|---|---|---|
| Lingan coal | $6 37 | Westmoreland | 8 50 |
| Caledonia | 6 00 | WarelyCo. Youghiogheny | 8 50 |
| Picton | $6 75@7 00 | Cannelton Cannel | 14 00 |
| Block House | 6 25 | Cumberland | 7 00@7 25 |
| Red Bank Cannel | 11 00 | Anthracite, | 6 25@7 50 |

## Buffalo, N. Y.

May 20, 1874.

| | | | |
|---|---|---|---|
| Youghiogheny Gas Coal | $6 00 | Connellsville coke | 8 00 |
| Catfish Lump | 4 75 | Beaver Gas Coal | 6 50 |
| " Nut | 3 50 | Red Bank Cannel | 5 50 |
| " Nut and Slack | 3 00 | " Orrel | 5 00 |
| " Slack | 2 85 | | |

Anthracite f. o. b. vessel. Retail prices $1 per ton additional, delivered.

| | | | |
|---|---|---|---|
| Lump | $6 50 | Stove | 6 45 |
| Grate | 6 00 | Chestnut | 5 95 |
| Egg | 6 00 | | |

## Chicago, Ill.

May 18, 1874.

REPORTED BY RENO & LITTLE, Coal Merchants.

No change in quotations of coal except Blossburg, which is $8.50. We quote:

| | | | |
|---|---|---|---|
| Lehigh Lump | $10 50 | Walnut Hill (W. V.) | 8 00@8 50 |
| Lehigh prepared | 10 00 | Midway (West Va.) | 8 00@8 50 |
| Lackawanna, Wilkes-Barre and Pittston, Grate, egg, and chest | 8 50 | Cannel | 9 00@10 00 |
| | | Blossburg | 8 50 |
| Stove or range | 9 00 | Indiana Block | 6 50 |
| BITUMINOUS. | | Hocking "Brooks" | 8 00 |
| Briar Hill and Erie | 8 00@8 50 | Wilmington and Illinois | 5 00 |

## Cincinnati, O.

May 19, 1874.

Reported by A. BUCHANAN & Co., wholesale and retail dealers in coal and coke.

We quote prices same as last week for this market; trade continues very slow. Shippers have almost discontinued sending railroad coal to this market for the time being, as the freight they have to pay makes the price too near that of Pittsburgh coal, which has a decided preference at anything like the same price. We quote:

| | Bush. | Tons. |
|---|---|---|
| Youghiogheny, or Pittsburgh, afloat | 10 c. | $2 80 |
| Pomeroy coal | 7 c. | 1 96 |
| Cannel coal | 18 c. | 5 04 |
| Semi Cannel | 9 c. | 2 52 |

The following are retail prices delivered:

| | | |
|---|---|---|
| Yougiogheny | 13 c.@14c. | $3 64@$3 92 |
| Pomeroy | 11 c.@12c. | 3 08@ 3 36 |
| Cannel | 22 c.@24c. | 6 16@ 6 72 |
| Semi Cannel | — 13c. | —— 3 64 |
| Anthracite | — — | —— 11 00 |

## Cleveland, O.

May 19, 1874.

Specially reported by our correspondent.

The coal trade remains very dull; no change in prices since last quotations. Many small miners, depending on this market for sale of their coal, have shut down entirely their works. Coal-heavers have resumed work this week at old prices. Miners in Straitsville region are still out. Producers offer 62 cents per ton during summer, and 80 cents per ton during winter. Miners ask 68 cents as summer, and 90 cents as winter prices. Nett ton, 2000 lb, is used here only.

| | Per ton. | | Per ton. |
|---|---|---|---|
| Youghiogheny, l'p, f.o.b. | $4 75 | Straitsville | $3 50 |
| Youghiogheny, nut | 3 75 | Columbiana | 3 75 |
| Briar Hill, (Church Hill) | 4 65 | Strip Vein | 4 00 |
| " " (Brookfield) | 4 50 | Mountain Blossburg (blacksmith) | 6 00 |
| Massilon, according to quality | $3 75 to 4 00 | Darlington and Sterling Cannel | 4 60 |
| Hocking Valley | 3 75 | | |

## Council Bluffs, Iowa.

ON TRACK.

| | | | |
|---|---|---|---|
| Blossburg (blacksmith) | $14 00 | Wyoming | 13 00 |
| Anthracite | 14 00 | Missouri | 6 00 |
| Iowa | 4 50 | Kansas | 6 00 |

RETAIL.

| | | | |
|---|---|---|---|
| Blossburg | $16 00 | Wyoming | $15 00 |
| Anthracite | 16 00 | Missouri | 8 00 |
| Iowa | 6 50 | Kansas | 8 00 |

## Detroit, Mich.

May 20, 1874.

Reported by ROBINSON & KEYS, dealers in all kinds of coal.

| | | | |
|---|---|---|---|
| Lehigh Lump, per ton | $11 00 | Brookfield | .... |
| Lehigh nut | 10 00 | Chippewa | .... |
| Wilkes-Barre, prep. sizes | 9 50 | Massilon | 8 00 |
| Blossburg | 9 00 | Straitsville | .... |
| Briar Hill | 8 50 | Erie | 8 75 |
| Willow Bank | 8 00 | | |

## Denver, Col.

RETAIL PRICES.

| | | | |
|---|---|---|---|
| Canon | $6 50 | Boulder Valley | $4 75 |
| Marshall | 5 50 | Eulner | 5 50 |
| Murphy | 5 50 | Black Diamond | 5 50 |
| Baker | 5 00 | | |

## Indianapolis, Ind.

May 19, 1874.

Reported by Messrs. H. MCCOY & Co.

Business in the coal trade dull; some mines have stopped altogether, others running with small force. There is no change in the price of Block coal, but Highland has declined 5 cents per ton. We quote at wholesale on board cars in city:

BITUMINOUS.

| | | | |
|---|---|---|---|
| Best Block coal | $2 90 | Indianna cannel | 6 50 |
| Best Highland | 2 35 | Hocking Valley | 3 00 |
| Block Nut | 1 75 | Youghiogheny | 4 75 |
| Highland " | 1 75 | Gas coke, per bushel | 12c |
| Block slack | 1 25 | Blossburg (smithing) " | 27 |
| Peytona cannel | 8 50 | Piedmont " " | 30 |

ANTHRACITE (Lackawanna).

| | | | |
|---|---|---|---|
| Grate | $9 75 | Chestnut | 9 75 |
| Egg | 9 75 | Stove | 10 25 |

## Louisville, Ky.

May 15th, 1874.

Specially reported by our correspondent.

Since the completion of the Louisville, Paducah & South Western Railway, rates of transportation on Coal have been reduced, and good coal is being delivered on cars at $2 per ton, retailed at $2.50 per load delivered, and has affected the sales of Pittsburgh coal very much. Heretofore the people have depended on Pittsburgh coal for supply, and have commenced stocking their winter coal in May and June. Now they know they have a supply to be depended on all the year round, and the consequence is a very dull market for all kinds of coal. We made sales yesterday of 182 tons at $2. Pittsburgh coal ranging from $3.25 to $3.50 retail, by barge at river $2.75 to $3 per ton. Very few manufacturing establishments running, which is the cause of a dull market. We anticipate an advance on coal of all kinds next month. We quote:

| | Bush. | Tons. |
|---|---|---|
| Pittsburgh, afloat | 10 c. | $2 80 |
| " retail | 14 c. | 3 92 |
| Kentucky | 11@13 c. | 3 08@3 64 |
| Indiana and Peacock Pomroy | 13 c. | 3 64@.... |
| Anthracite, per ton, from yard | | 10 00@10 50 |
| " afloat | | 9 00@ .... |

## New Orleans, La.

May 9, 1874.

Reported by P. and R. DEVERGES, Wholesale and Retail Dealers in Pittsburgh, Anthracite and Cannel coal,

We have no change to report in the coal market; the supply is more than sufficient for the demand, with prices in favor of buyers. We quote:

| | |
|---|---|
| Pittsburgh coal, retail, per bbl | nominal |
| " wholesale, per bbl | 35@37½c. |

| | |
|---|---|
| " per bbd | $7 00 |
| " to steamboats, per box | 50c. |
| " to manufacturers, per bbl | 60c.@ |
| Anthracite, retail, per ton | $12 50 |
| " wholesale per ton | $8 50@ 9 00 |
| Spadra (Arkansas) coal, retail, per bbl | 75c. |

### Pittsburgh, Pa.

May 19, 1874.

| | per ton. | | per ton |
|---|---|---|---|
| Youghiogheny coal | $2 25 | Anthracite all sizes | $7 00 |
| " coke | 2 75 | Castle Shannon coal on platform, per bushel | 7½c. |
| Connellsville coal | 2 25 | | |
| " coke | 3 25 | | |

### San Francisco,

From the *Commercial Herald* May 6.

COAL—Imports from January 1st to May 1st:

| | Tons. | | Tons. |
|---|---|---|---|
| Anthracite | 1,822 | Vancouver Island | 20,377 |
| Australian | 18,580 | Bellingham Bay | 6,780 |
| Coos Bay | 19,684 | Rocky Mountain | 303 |
| Cumberland | 3,241 | Seattle | 979 |
| English | 1:005 | Mt. Diablo (3 mos) | 40,492 |

Imports during April were less than the average. There are, however, a good many vessels en route to this port from various points, coal laden, causing it to be difficult to negotiate cargo sales to arrive except at low prices. Australian for May and June delivery freely offered at $10.50@11 per ton without finding buyers. The Victor from Newcastle, N. S. W., brought 900 tons. The Lincoln mines are now sending us supplies, with a view of testing their value; 4 car loads (40 tons) received. Coast mines are producing steadily and increasing in quantity, especially the Bellingham Bay and Coos Bay mines, the former selling at $8.50 per ton. The Eastport and other Coos Bay mines are furnishing us free supplies at $10. These two last named Bituminous enter very largely into use for household purposes, and give good satisfaction. Cumberland is plentiful at $20@23. Australian we quote at $10.50@11; West Hartley, $13. Anthracite is scarce, particularly Lehigh, which sells at high figures. Cumberland is in fair supply, and is also selling from yard at high rates. The California Mt. Diablo mines, Black Diamond and others, continue to produce largely of Steam coals, finding ready sale at $6.25@8.25 per ton for coarse and fine—the latter screenings being preferred by all local factories to the lump.

*Note*—Prices in gold.

### St. Louis, Mo.

May 19, 1874.

Reported by the COLLINSVILLE COAL AND MINING COMPANY.

Prices per ton of 2000 lb. are as follows:

ANTHRACITE.

| | |
|---|---|
| Lehigh Lump | $14 50 |
| Lackawanna and Wilkesbarre | 13 50 |

BITUMINOUS.

| | |
|---|---|
| Indiana Cannel | $7 00 |
| " Block | 6 00 |
| Washington Indiana—smithing | 4 87 |
| O. Fallen, to manufacturers | 3 00 |
| Illinois | 2 75 |

Retail, 25c. per ton additional.

### Toledo, Ohio.

| | | | |
|---|---|---|---|
| Scranton, all sizes | $9 00 | Briar Hill | 6 00 |
| Lehigh Lump | 11 00 | Bituminous | 4 50@6 50 |
| Blossburg | 8 50@ 9 00 | | |

### Halifax, N. S.

May 8, 1874.

Per chaldron of 3000 lb.

| | | | |
|---|---|---|---|
| Sydney (old mines) | $7 75 | Little Glace Bay | 7 50 |
| Other Sydney coals | 7 00 | Albion (at railroad) | 7 50 |
| Gowrie | 7 50 | | |

### Toronto, Ont.

Prices in gold, per ton of 2000 lb.

| | | | |
|---|---|---|---|
| Scranton, all sizes | $7 50 | Bituminous | 7 50 |
| Lehigh prepared | 8 50 | Blossburg | 7 00 |
| " Lump | 9 00 | | |

### Montreal.

May 18th, 1874.

Specially reported by our correspondent.

The experience of a coal famine, two years ago, has led to large importations from the lower provinces, and a good supply remains on hand this spring. Consumers have learned that coal is declining in price in England, and that the provincial coals have been in a great measure excluded from the U. S. market this year; they therefore look for a reduction in prices and are not yet prepared to make contracts. During the winter the Grand Trunk Railway secured the full quantity needed here by purchasing 35,000 tons Albion and 70,000 tons Intercolonial at $5 90 at Montreal. Outward freights from England being depressed, numbers of vessels are running out to Sydney in ballast, seeking coal charters, and in consideration of the light demand here, freights have declined to $2 50, as against $3 25@3 50 last year. Many of the steamers bound here to load grain offer to bring up coal, so the supply of topage at present is abundant. For the past two years vessels have been much inquired for, and many have hoped that American vessels might be admitted to our coasting trade. This has been granted to Italians, and perhaps to Germans, and it is trusted that reciprocity with the United States may permit us to see the Stars and Stripes oftener in our River. The Cape Breton coal at present can be laid down here at about $5 15 per ton, and the Pictou coals at $5 90. Scotch coal is quoted at $6@6 25, although one large manufacturing firm is making an importation said to cost only $5 50. Newcastle smiths' has been offered at $9 75, but new shipments at reduced cost are quoted at $8.

## TOWING

Our usual tables of these rates have been crowded out this week; there has been no change since our last issue to which we refer.

### Freights.

| PORTS. | From Baltimore and Georgetown. | From Port Richmond, Philadelphia. | *From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken |
|---|---|---|---|
| Augusta, Me | 3 50 | .... | .... |
| Albany | 2 30 | .... | .... |
| Amesbury, Mass | .... | .... | .... |
| Bangor, Me | 3 15 | 2 50 | 1 70 |
| Bath, Me | 2 60 | .... | 1 80 |
| Baltimore | .... | .... | .... |
| Boston, Mass | 2 50 | 2 15 | 1 70 |
| Bridgeport, Ct | 2 10 | 1 50 | 85 |
| Bristol, Ct | .... | 1 75 | 1 20 |
| Derby | .... | 1 50 | 1 15 |
| Dighton | 2 30 | .... | .... |
| East Cambridge | .... | .... | ††1 70 |
| Fall River | 2 15 | 1 75 | 1 20 |
| Hackensack | .... | .... | .... |
| Hartford | 2 60 | .... | 1 40 |
| Hoboken | 1 80 | 95 | 45 |
| Hudson | 2 30 | .... | .... |
| Jersey City | 1 80 | 95 | 45 |
| Middletown | .... | .... | 1 25 |
| Mystic | .... | .... | 1 15 |
| Newark | 2 05 | .... | .... |
| New Bedford | 2 15 | 1 75 | 1 25 |
| Newburyport | 2 65 | 2 50 | 1 85 |
| New Haven | 2 10 | 1 50 | 85 |
| New London | 2 15 | 1 65 | 1 10 |
| Newport | .... | 1 75 | 1 20 |
| New York | 1 90 | ¶ 95 | § 40 |
| Norfolk | 90 | .... | .... |
| Norwalk | 2 25 | 1 50 | 85 |
| Norwich | 2 25 | 1 50 | 1 15 |
| Pawtucket | 2 50 | 1 90 | ‡‡1 30 |
| Philadelphia | 1 00 | .... | .... |
| Portland | 2 50 | 3 00 | 1 60 |
| Portsmouth, N. H. | 2 65 | 2 60 | 1 85 |
| Providence | 2 05 | 1 75 | 1 20 |
| Petersburg, Va | 1 50 | .... | .... |
| Richmond, Va | 1 15 | .... | .... |
| Rockport | .... | 2 70 | .... |
| Saco | .... | 3 00 | 2 10 |
| Sag Harbor | 1 25 | .... | 1 10 |
| Salem | 2 65 | 2 50 | 1 70 |
| Savannah, Ga | 2 40 | .... | .... |
| Stamford | .... | 1 50 | 85 |
| Stonington | .... | 1 75 | 1 20 |
| Taunton | .... | .... | 1 60 |
| Troy | 2 30 | .... | .... |
| Warren | .... | .... | 1 20 |
| Washington | .... | .... | .... |
| Wareham | 2 50 | .... | 1 50 |
| Wilmington, Del | 1 05 | .... | .... |

Rates from Rondout to New York 15 to 20c. above Weehawken. They are 5c. less from Newburgh going south, and 5c. above Newburgh rates going north.

§ Under 150 tons, 50c. per ton.

¶ This is the rate alongside. Delivery on wharf costs from 16c. to 18c. additional.

†† Towing extra.

‡‡ 3c. per ton per bridge extra.

* Freights from South Amboy are 5c. above these rates.

### Freight on Pittston Coal—From Newburgh.

By boats of the Pennsylvania Coal Co., per ton of 2240 lb.

| | |
|---|---|
| To Troy, Albany and Stuyvesant | 60 c. |
| " Nyack and Hudson and Boston R.R. dock, Hudson, discharged to cars | 50 c. |
| " Hudson, except as above, Rondout and Poughkeepsie | 35 c. |
| " Catskill, at mouth of creek, Sing Sing, Tarrytown, Piermont, and Yonkers | 55 c. |
| " Fishkill Landing and West Point | 25 c. |
| " Peekskill, Haverstraw, Saugerties, and Tarrytown | 45 c. |
| " New York | 65 c. |

MISCELLANEOUS FREIGHTS.

*Gas Coals.*

| | |
|---|---|
| From Fairmont and Clarksburg, via B. and O. R. R., to Baltimore, including loading | $5 20 |
| From Coalburg and Paint Creek to Richmond, via C. and O. R. R., per ton, including loading | 3 75 |
| From Richmond to New York | 2 |

### Lehigh and Delaware Division Canals.

MAUCH CHUNK, PA., March 25, 1874.

Until further notice the following rates of toll, via the above canals will be adopted:

| | |
|---|---|
| From Mauch Chunk to Easton per ton of 2240 lb | 46c. |
| " " " " Bristol or New Hope | 70c. |
| Towing from Bristol to Philadelphia | 7c. |

On local shipments the toll sheets of 1873 will remain in force.

### Erie and Champlain Canals.

NEW YORK AND SHIPPING POINTS IN THE VICINITY TO

| | | | |
|---|---|---|---|
| * Buffalo and Lockport | $1 85 | * Utica, N. Y | 1 25 |
| * Rochester | 1 75 | * Syracuse, N. Y | 1 35 |
| * Burlington, Vt | 1 75 | *Oswego, N. Y | 1 70 |
| Albany | 85 | Troy | 90 |

* Alongside.

| | | | |
|---|---|---|---|
| *Montreal, Canada, gold | $2 75 | Ottawa, Canada | 3 25 |
| St. Johns, N. B | 2 50 | Quebec | 3 25 |

* Harbor towing extra

### Chesapeake and Ohio Canal.

BITUMINOUS COALS.

The freight on George's Creek coal per ton of 2240 lb. to Georgetown is $1 86. To Alexandria, Va., it is 11c. per ton more. By the B. & O. R. R. to Baltimore the freight on George's Creek coal is 2.70 per 2000 lb., and 4c. per gross ton for use of cars.

On bituminous coal from Cannelton to Richmond via the C. & O. R. R. the transportation amounts to $3.65 per net ton.

### Delaware and Raritan Canal.

TOLLS AND TOWING.

Per ton of 2240 lb.

| | | |
|---|---|---|
| Fairmount to New York | | 64 cents. |
| Greenwich | " | 66¾ " |
| Trenton | " | 35 " |
| Port Richmond | " anthracite | 58 " |
| Philadelphia | " bituminous | 65¾ " |

### Chesapeake and Ohio Railroad.

For Cannel coal from any point in the Kanawha Valley to the James River wharves below Richmond, including terminal charges per ton of 2000 lb ..... $5 35
Subject to rebate in large quantities.

For Semi Cannel or splint coal from any point in the Kanawha Valley to the James River wharves including terminal charges ..... 3 65

## THE BRITISH COAL TRADE.

LONDON, May 2, 1874.

The prices of coal and the condition of trade are about the same as at the date of our last. The question between labor and capital is about being brought to a test in nearly all the districts. The strike in South Staffordshire district, after a continuation of about five weeks, is now assuming a better shape, both the miners and masters showing a strong desire to form a Board of Conciliation. A meeting of the coalmasters was convened last Wednesday at Dudley, and would have passed a formal resolution on the subject but for the fact that, by an omission in sending out the circulars, the Cannock Chase firms had not been summoned to the meeting. An adjournment until Monday next was resolved upon under these circumstances, and there is no doubt the proposed conciliation board will then be agreed upon. With 1,200 men "out" in South Staffordshire, and 2,000 in North Warwickshire, and with numerous actual and prospecting claimants in other coal fields, it is very doubtful if the funds of the Union will hold out for any great length of time. Although the production in South Staffordshire is very limited, yet it more than meets the demand.

The matters at issue between the proprietors and workmen in the Somersetshire coal fields were submitted for arbitration to Mr. RUPERT KETTLE, on Monday. The masters asked for a reduction of 25 per cent, and, after a hearing of witnesses and an examination of accounts by professional accountants, a decision was rendered very much in the masters' favor, the reduction being placed at 23¾ per cent. Some of the miners do not accept the decision with a good grace; but a refusal to do so will undoubtedly be followed by a withdrawal of public sympathy and substantial aid from their comrades in other districts. In the course of the arbitration it was shown that the new Miners' Act places upon the production of coal an additional cost of 2/ 6d per ton.

The Northumberland miners and coal owners have come to an arrangement The miners, having had their wages advanced 50 per cent., agree to submit to a reduction that would leave the advance at 40 per cent., which is equal to a reduction of 5 per cent. from the gross wages. The Durham miners make the same proposition, but the masters insist upon a reduction of 10 per cent. from their gross earnings. The matter will probably be referred for arbitration to two representatives to be chosen from each side, with an umpire.

In the North of England, household coal is sold at 14/@17/; ordinary coke at 18/@20/; and first class foundry qualities at 21/@22/ 6d. at the pit.

In South Yorkshire, a very good quality of household coal can be purchased as low as 11/ 6d. per ton, and Silkstones 14/ Lord DUDLEY has reduced the price of his coal, which is now offered, per ton of 2,240 lb., as follows: Best thick coal, 20/; seconds, 15/ 6d.; steam coal, 14/; engine slack, 7/; and other coal in proportion.

*Wales*.—The demand is light, and prices have a downward tendency. So dull is the inquiry for coal that at many of the pits only two days' work is done in the week, and at some of the pits only one day's work. Mr. HALIDAY has addressed several meetings of colliers, and his counsels tend to conciliation. There are yet some three or four weeks to elapse before the contracts between the masters and the workmen terminate, so that it is impossible to predict the final result. A general lock-out affecting more than 10,000 men is threatened in the South Wales anthracite coal trade if a proposed reduction of 20 per cent. in wages be not accepted to day. The prices of steam coals have been slightly reduced, although house coals remain about the same.

*Scotland*.—The prices of coal appear to be maintained at a figure considerably higher than the extraordinary supplies would warrant. The Union seems to be in a very disorganized state, and the leaders are in ill repute. Some resistance continues to be shown by a portion of the men, but it is quite evident that they will be unable to continue it, and will eventually have to accept the masters' terms, which are now reductions ranging from 30 to 50 per cent.

## IRON MARKET REVIEW.

### Import Duties.

The following are the duties in Gold on Iron :

*Flat Iron*, not less than 1, nor more than 6 inches wide, nor less than ¾, nor more than 2 inches thick. *Round Iron*, not less than ¾, nor more than 2 inches in diameter, and *Square Iron*, not less than ½, nor more than 2 inches square ₱ lb. 9-10 of 1c. *Flat Round or Square Iron*, of larger or smaller sizes than the above mentioned, per lb ..... 1 35-1000

*Provided*, that all iron in slabs, blooms, loops, or other forms, less finished than bars, and more advanced than pig iron, except castings, shall pay the same as iron does.

*Provided*, that none of the above iron shall pay less than 31½ per cent.

Railroad Iron.....63c. per 100 lb.
Boiler plates, or other plate iron not less than 3-16 of an inch thick, per lb..... 1 35-100 c.
Scrap castings per ton..... $5 40
" wrought " " ..... 7 00
Pig Iron per ton..... 6 30
Iron ore 10 per cent. *ad valorem*.

#### New York.

May 22, 1874.

To express the condition of trade, we would say there could hardly be less doing. Prices show a decided downward tendency. There are no buyers and all sellers, and this has resulted in an accumulation of stocks, which locks up a large amount of money, much of which has been borrowed ; and it will be necessary to borrow more. Although the majority of the furnace companies are undoubtedly strong, yet it is quite probable that a number may find it more convenient to sell stock at a heavy concession, than to borrow; especially as some companies have considerable paper afloat, and it requires a heavy "shave" to float more. This feeling is quite prevalent among buyers, as is shown by the prices they offer, and their action in withholding orders. They think that before the summer is past, their anticipations will be realized. Some of the companies, in easy finances, are standing firm in their quotations, as they do not care to sell at a loss. This results in a total absence of orders, and we see nothing for them to do, but close their works when they have completed the orders they have on their books, or find some way of making cheaper iron. The Thomas and Crane Iron Cos. have made a move toward accomplishing the latter result, by lowering the wages of their men ten per cent. yesterday. It will be necessary for the other companies to follow the same course, and it is very doubtful if a much greater reduction will not have to be made. This will likely bring about strikes, which with many would be quite desirable, although to the workmen it would result in misery. Keepers were paid by these companies $2 25 per day; helpers $2 10, and fillers $2 00 per day.

***American Pig.***—There is but very little doing. Two hundred tons Allentown No. 1 x, were sold at $32 50, and 200 tons No. 2 x, same make, at $30. With these figures before us, we do not see how higher quotations can be given. In the absence of actual transactions it is impossible te state at what figure pig iron can be bought, but it is generally acknowledged that if a dealer or consumer enters the market with cash and the intention of buying, he is not permitted to leave without purchasing.

No. 1, Foundry Anthracite.....$32 50@33 00
No. 2, " " ..... 30 00@— —
Grey Forge..... 26 00@29 00
White and Mottled..... 20 00@24 00
Salisbury Charcoal Carwheel..... 62 00@— —

***Scotch Pig.***—The demand has been smaller during the week than for some time past. The only sales we learned of were 200 tons of Glengarnock, and 50 tons of Summerlee.

By Cable, on the 20th inst., we learn that the demand in Glasgow was very light, and that Summerlee was quoted at 98/; Glengarnock, 101/; Carnbroe, 95/; and Eglinton, 87/. These prices are about the same as reported by us in our last. Prices here are firm, which is owing to the small stock in this market, with but little afloat. Mail advices from Glasgow, bearing date of the 8th inst., state that the stocks are not one-half what they were at the corresponding time last year; the stock in store being only 28,496 tons, as compared with 68,401 tons on May 8th, 1873. Whilst this is the case, the furnaces are gradually being blown in, and the men, greatly exhausted, have had to submit to the reduced rate of wages offered them. We quote: Coltness, at $40; Glengarnock, $37; Summerlee, $37; Carnbroe, $36@36 50, and Eglinton, $34@35.

***Iron Rails.***—Prices are weak, with a downward tendency, and quotations are quite nominal. We note the sale of 1,000 tons 56 lb., American, on private terms. There is nothing doing in English rails. The inquiry continues as great as ever, and from parties who offer to purchase on undesirable credit. We give the following as nominal quotations: American at mills, $58@60 currency, and Foreign, $52@54, gold, here.

***Bessemer Rails.***—We learn of no transactions, and find prices weak. American may be nominally quoted at $98@100 currency, at the mills, and Foreign, in this city, at $94@97 50 gold.

***Old Rails.***—We learn of sales of a mixed lot of about 2,000 tons T's. and Bridge at $36, and 200 tons T's.@$38. Prices have a downward tendency, and the figures of the above transactions may be considered the regular quotations. There are a few hundred tons on the way from England.

***Scrap Iron.***—Prices are weak. No. 1 wrought, to arrive, may be quoted at $37 50, and in yard, at $39. Cast-scrap is quoted at $22@28.

#### Baltimore,

May 16, 1874.

There is some little movement in American Pig to report, and we note sales of 300 to 400 tons of anthracite, for foundry purposes, at ruling quotations. We quote as follows : anthracite at $33 for No. 1 ; $32 for No. 2, and $29 for No. 3 ; Baltimore charcoal forge at $43, and Scotch Pig nominally, at $45 per ton, from yard.—*American Commercial Advertiser.*

#### Chicago

May 19, 1874.

ROGERS & Co., dealers in Scotch and American pig iron, report the market as follows :

We have no change to report in prices for pig metal, or condition of our market. We quote :

No. 1 Coltness.....$46 00@ ....
No. 1 Gartsherrie..... 45 00@ ....
No. 1 Summerlee..... 44 00@ ....
No. 1 Glengarnock..... 43 00@ ....
No. 1 Eglinton..... 42 00@ ....
Warner's "American Scotch"..... 40 00@ ....
No. 1 Grand Tower Mo. ores (Bituminous)..... 38 00@ ....
No. 2, " " " ..... 33 00@ ....
No. 1 Forge..... 30 00@ ....
Union "A" 1 (Anthracite)..... 35 00@ ....
Union "B" 1 (Anthracite)..... 33 00@ ....
No, 1 Lake Superior (charcoal) ..... 41 00@42 00
No. 2 Lake Superior " ..... 38 00@40 00
No. 3 Lake Superior " ..... 43 00@45 00
No. 4 Lake Superior " ..... 45 00@48 00

#### Cincinnati.

May 19, 1874.

Reported by TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

There has been a slightly better demand for carwheel brands of C. B. pig iron. Other descriptions are extremely dull, and prices have still a downward tendency. We quote:

CHARCOAL.

Hanging Rock, No. 1, Foundry.....$36 00@37 00—4 mos
" No. 2, " ..... 33 00@35 00—4 mos
" Mill..... 30 00@31 00—4 mos
Tennessee No 1, Foundry..... 35 00@36 00—4 mos
Tennessee. No. 2 " ..... 33 00@34 00—4 mos
" Mill..... 30 00@31 00—4 mos
Missouri, No. 1, Foundry..... 37 00@38 00—4 mos

STONE COAL.

Ohio No. 1, Foundry..... 35 00@36 00—4 mos
" No. 2, " ..... 32 00@33 00—4 mos
Ohio Mill..... 29 00@30 00—4 mos
Missouri, No. 1, Foundry..... 35 00@36 00—4 mos
" No. 2, " ..... 32 00@33 00—4 mos
" Mill..... 29 00@30 00—4 mos

CAR-WHEEL.

Hanging Rock, C. B..... 55 00@60 00—4 mos
Tennessee " ..... 50 00@55 00—4 mos
Missouri " ..... 55 00@57 00—4 mos
Alabama " ..... 50 00@55 00—4 mos

BLOOMS.

Charcoal ..... 85 00@100 00—cash

SCRAP IRON.

Cast..... 1 00@ ....—cash
Wrought ..... 1 25@ 1 50—cash

#### Cleveland

May 19, 1874.

C. E. BINGHAM & Co., dealers in pig iron and iron ores, report the market as follows :

There has been no appreciable change in our pig iron market during the last week. We quote as follows :

No. 1, Anthracite Foundry.....$33 00@34 00—4 mos
No. 2, " " ..... 30 50@32 00—4 mos
No. 1, Bituminous " ..... 33 50@34 50—4 mos
No. 2, " " ..... 31 00@32 50—4 mos
No. 1, Grey Forge Bituminous..... 27 00@29 00—4 mos
No, 2, Close Grey..... 26 00@27 00—4 mos
No. 1, Massilon Black Band ..... 36 00@37 00—4 mos
No. B-1 " " ..... 34 50@35 50—4 mos
No. 2 " " ..... 33 00@34 00—4 mos
No. 1, Lake Superior Charcoal..... 40 00@41 50—4 mos
No. 2, " " ..... 38 00@39 00—4 mos
No. 3, " " ..... 43 00@44 50—4 mos
Nos 4, 5, 6, " " ..... 47 00@50 00—4 mos
American Scotch..... 34 00@35 00—4 mos

#### Detroit.

May 19, 1874.

Scotch pig, net .....$44 00@ ....
Lake Superior pig, No. 1..... 44 00@ ....
" " No. 2..... 43 00@ ....

#### Louisville.

May 19, 1874.

GEORGE H. HULL reports the market as follows:

The market is dull and lower for nearly all grades. Large sales can only be effected by making some concessions, the legitimate demand being confined to small lots for immediate use.

The usual time, 4 mos., is allowed on the quotations below:

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock ores..... $34 00@37 00
No. 2 " " " ..... 32 00@34 00
No. 1, forge, " " ..... 29 00@30 00
No. 1, foundry, " Tennessee " ..... 33 00@35 00
No. 2 " " " ..... 32 00@33 00
No. 1, forge, " " ..... 29 00@30 00
No. 1, foundry, " Alabama " ..... 34 00@36 00
No. 1, " " Iron Mountain " ..... 36 00@38 00

HOT BLAST—STONECOAL.

No. 1, foundry, from Missouri ores..... 34 00@35 00
No. 2, " " " ..... 32 00@33 00
No. 1, forge " " ..... 28 00@29 00

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock ores..... 55 00@58 00
" " Tennessee " ..... 50 00@53 00
" " Alabama " ..... 53 00@55 00
" " Georgia " ..... 53 00@55 00
" " Missouri " ..... 50 00@55 00
" " Kentucky " ..... 50 00@55 00

#### San Francisco.

May 7, 1874.

The market for imports appears to be fully supplied with pig iron. In the absence of sales prices are quite nominal Glengarnock No. 1 is now offered at $40 per ton, without finding buyers. The Oswego Iron Works, situated in Oregon, has recommenced operations, and promises regular monthly shipments of 250 tons pig iron to this market. This iron is of good quality, having in years past been tested by our foundrymen.

#### Pittsburgh.

May 19, 1874.

Reported by A. H. CHILDS, commission merchant for the sale of pig iron, blooms, ore, &c.:

There has been little or no change in this market since our last report. Occasionally sufficient inducement is offered to tempt speculative purchasers, but consumers have for the most part been buying only for immediate use. Present quotations are :

No. 1 Foundry, anthracite or bituminous.$30 00@32 00—4 mos
No. 2, " " " . 28 00@30 00—4 mos
No. 1, Mill " " . 27 00@28 00—4 mos
White and mottled" " . 25 00@26 00—4 mos

The Pittsburgh *Commercial* reports the following sales for week ending May 15th:

IRON MADE FROM LAKE SUPERIOR ORES, SMELTED BY BITUMINOUS COAL.

1060 tons gray forge, .....$27 00— 4 mos
350 " " " ..... 27 00—cash.
300 " " " ..... 25 00—cash.
200 " " " ..... 26 00—cash.
200 " " " ..... 28 00—4 mos
200 " " " ..... 28 00—6 mos
100 tons No. 3 mill..... 27 00—4 mos
100 tons mottled..... 26 00—4 mos
100 tons gray forge..... 28 00—4 mos
100 tons close gray and mottled..... 26 00—5 mos
70 tons white..... 25 50—4 mos
50 tons mottled..... 26 50—4 mos
50 tons white..... 24 50—4 mos
30 tons foundry..... 31 00—4 mos
25 tons foundry..... 30 00—4 mos
26 tons No. 1 foundry.....$32@ 33 00—4 mos
20 tons No. 2 foundry..... 28 00—4 mos
20 tons No. 3 foundry..... 28 00—4 mos
20 tons silvery..... 25 00—4 mos
10 tons No. 3 foundry..... 30 00—cash.

ANTHRACITE.

100 tons gray forge..... 27 50—4 mos
25 tons " " ..... 25 50—cash.

EASTERN CHARCOAL.

20 tons No. 1 foundry, c. b..... 50 00—4 mos
10 tons No. 1 foundry, c. b..... 50 00—4 mos

HANGING ROCK CHARCOAL.

60 tons No. 2 foundry..... 36 00—5 mos
38 tons No. 3 foundry..... 32 00—4 mos
36 tons No. 2 foundry..... 35 00—4 mos
19 tons No. 1 foundry..... 40 00—4 mos
10 tons c. b..... 50 00—4 mos

CONNELLSVILLE COKE.

300 tons close gray..... 27 00—4 mos
200 tons gray forge..... 27 00—4 mos
100 " " " ..... 26 00—cash.
100 " " " ..... 28 00—4 mos

#### St. Louis, Mo.

May 16, 1874.

BLAST STONE COAL PIG.

No. 1 foundry from iron Mountain and Maramac ores, $30@33
No. 2 foundry from Iron Mountain and Maramac ores, 29@31
No. 3 forge from Iron Mountain and Maramac ores, - 25@29
No. 1 Massilon, - - - - - - - - - - 43@..
No. 1 Tennessee, cold short, - - - - - - - 36@..
No. 1 Ohio, cold short, - - - - - - - - 40@..

HOT BLAST CHARCOAL PIG.

No. 1 foundry from Iron Mountain and Maramac ores, 35@40
No. 2 foundry from Iron Mountain and Maramac ores, 34@36
No. 1 foundry from Tennessee ores, - - - - - 35@37
No. 1 forge from Tennessee ores, - - - - - 31@33

COLD BLAST CHARCOAL PIG.

Hanging Rock car wheel, - - - - - - - - 60@64
Tennessee, - - - - - - - - - - - 58@60

MISSOURI IRON ORES.

Iron Mountain Co.'s Quotations.

Iron Mountain, per ton..... .....$8 00
Benton Creek, " ..... 7 50
Surface ores, " ..... 8 00
Red and brown hematites, per ton..... 5 00@6 50
Pilot Knob, per ton..... 5 00
Rails, 50 to 60 lb. inclusive .....66 00@68 00

## THE BRITISH IRON TRADE.

LONDON, MAY 2, 1874.

Some districts show an improved demand and firmer prices. This improvement, however, is mostly confined to the North of England, and is undoubtedly brought about by the anticipated strike of the Durham miners, who have expressed a willingness to submit to a reduction that will make the advance 48½ per cent. instead of 58½ as it now is. The masters insist upon a reduction of 10 per cent. from the gross wages, which would reduce the advance to about 43 per cent. Business in South Staffordshire continues in a very languid state, there being but very little done. Prices are easier all round than at the commencement of the coal strike, but this does not bring out orders enough to employ such of the works as there is fuel for. Increased supplies of Belgian iron continue to find their way into this district at prices from £2 10/@£3 10/ below the ruling rates of iron of equal quality. The coal miners' strike is near adjustment, as both miners and masters have shown a strong desire to form a Board of Conciliation which will likely bring about a settlement of the present dispute, although the majority of masters express the belief that an additional reduction of 15 per cent. will have to be made before business can move with much activity. The Bessemer steel business in all the districts is reported in a very healthy condition, and several important orders have been placed

We still notice a weakness in the financial standing of several iron firms.

Trade in Wales bears a very gloomy appearance, with no immediate prospect of improvement. There are very few of the works fully employed, and others are compelled to close from a lack of orders. Buyers show no inclination to place orders until the labor question is settled, and makers are not anxious to accept them, as they assert that iron manufacture at present prices shows a loss. The question between labor and capital will undoubtedly be arbitrated; the makers say there must be a substantial reduction in wages before they can manufacture at prices which will bring out orders. Both masters and men appear firm; but, as a sharp contest between them must ensue at some time, the masters think this the most desirable moment to test the strength of the Union.

In the North of England, No. 1 pig iron is quoted at from 70/@72/ 6d.; No. 3 at 62/ 6d.@65/; No, 4 foundry at 64/; and forge at 62/ per ton. In South Staffordshire, pig iron ranges from £3 12/ 6d. for common cinder to £5 12/ 6d. for mine iron. At Barrow-in-Furness, best Bessemer pig is quoted at £5 17/ 6d, being a decline of 5/ since last week. Indian charcoal pigs in this city, £10@£12. Rails are quoted at £8 10/@£9 in Wales, and £8 15@£9 15/ in the North of England.

*Scotland.*—Pig iron is from 2/ to 3/ higher than at the date of our last. The makers' stocks may be said to be almost completely exhausted, and the general stores have become so much reduced that should the inquiry for iron increase, the supply would only hold out for a very short time. On Wednesday the business transacted in warrants was between 78/@78/ 9d. A portion of the workmen show a desire to continue the strike, but, with the furnaces blown out, there is nothing for them to do but accept the masters' terms, or procure another occupation. The majority of the men, however, show a willingness to submit to the reductions, which range from 30 to 50 per cent. The shipments of Scotch pig for the week ending April 25th were 8,771 tons as compared with 12,996 tons for the corresponding week in 1873, showing a decrease since December 25th of 68,507 tons. The imports of Middlesbrough pigs into Grangemouth for the same time were 1,390 tons as compared with 500 tons for the corresponding week of last year, and a total increase since January 1st of 20,112 tons. The quotations of makers' brands are quite nominal, but No. 1 g. m. b. may be given at 80/@81/, and No. 3 at 78/@79/.

## METALS.

NEW YORK, May 22, 1874.

***Gold Coin.***—During the week past gold has ranged from 112 to 112⅝, and closed yesterday at 112⅜.

***Bullion.***—Fine silver bar is quoted at $1 28½@$1 29½, gold, per ounce, and fine gold bar at par ($20 67, gold, per ounce.)

***Copper.***—The market is quiet. During the past week sales have been made of about 200,000 lb. at 24¾c., and 200,000 lb. for future delivery at 24½c.@24¾c. A telegram, dated yesterday, from the Lake Region, stated that there had been no copper shipped east; but, as navigation is open, it will likely move in a day or two, and we may expect to see the first arrival about the 5th to the 10th of June, as heretofore calculated. The latest London quotation by cable was £74 for Chili bars. About 25,000 lb. Chili bars have been received at this port, and more is anticipated. This is a portion of the stock previously reported to arrive on the account of individual firms who hope to break this market by importing. They will have to make a much greater show than this if they desire to make their work tell. It is thought this importation will show a loss of from 2 to 3 cents per lb. Spot and future copper are both quoted at 24¾c.

***Tin.***—The market is dull, and transactions are entirely of a jobbing nature. The strike in Wales shows no change. Straits is quoted at 24c.; L. & F. at 21¾c.; Refined English, 22½c., and Banca, 26½., all gold. There is but very little Banca in this market. The latest cable quotations from London were: Straits, £98@£99; refined English, £102; and L. & F. £99. I. C. charcoal tin plates, in this city, are held $10 50 gold, and roofing plates at $9 50, gold.

***Lead.***—The market is still depressed and prices drooping. Sales have been made as low as $5 85, and 50 tons in bullion have been sold at $5 75. The arrivals this week of several hundred tons from the West have increased the stock on hand to about 2,500 tons. Soft Spanish can be laid down at 6⅛c., gold.

***Spelter.***—There is but little business doing. Domestic is quoted at 7c.@7¼c. currency, and Silesian at 6⅝c.@6¾c. gold.

***Zinc.***—The market is quiet. Domestic is quoted at 8⅛c.@8¼c., and Silesian and Mossel man sheet, at 8½c.

***Antimony.***—There is nothing doing. We quote at 12½c. gold.

***Manganese.***—Sales are light. We quote: Pyrolusite, crystallized, 7c.; Manganite, crystallized, 6c., and Psilomelane or Virginia Manganite, 3½c.

***Quicksilver.***—The demand, as heretofore reported, is far ahead of the supply. The quotation in San Francisco is $1 35 gold per lb.; in London, £19 15/ per flask (76½ lb); and in this city, $1 50 gold, per lb. The Quicksilver Mining Company's production in April was 735 flasks, as compared with 750 flasks for the previous month, and 1,000 flasks for April, 1873. The production from January 1st to April 30th, inclusive, was 2,835 flasks, as compared with 4,432 flasks for the corresponding period last year, showing a decrease of 1,597 flasks.

## San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, May 21, 1874.

The following report from the San Francisco Stock Board is dated the 19th inst. With the exception of a slight decline in Belcher, and Raymond & Ely, the market has advanced.

| | | | |
|---|---|---|---|
| Savage | 63 | Imperial | 4⅝ |
| Crown Point | 89 | Raymond & Ely | 23 |
| Yellow Jacket | 72 | Meadow Valley | 10¾ |
| Kentuck | 15 | Eureka V G | 9 |
| Chollar Potosi | 60 | Ophir | — |
| Gould & Curry | 21 | Hale & Norcross | — |
| Belcher | 81 | | |

## Boston Stock Market.

BOSTON, May 20, 1874.

The prices bid for copper stocks at the first session of the Boston Stock Board are as follows:

| | | | |
|---|---|---|---|
| Allouez | 7¾ | Pewabic | 8 |
| Calumet and Hecla Co. | 130 | Phœnix | 14 |
| Copper Falls | 18½ | Quincy | 34 |
| Central | — | Ridge | 4 |
| Franklin | 4¼ | Rockland | 1 |
| Mesnard | 1 | St. Clair | 2 |
| National | 3 | Star | 1¾ |
| Petherick | 1½ | | |

## American Institute of Mining Engineers.

OFFICIAL BULLETIN.

**Announcements to Members and Associates.**

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The Council earnestly requests members to forward to the Secretary, for preservation, copies of all printed mining and geological reports, particularly pamphlets, which may fall in their way. It is believed that by this means a large amount of valuable fugitive information concerning different regions and properties in this country, may be caught and preserved.

IV. The Fourth Annual Meeting of the Institute will be held in St. Louis, during the last week in May. It is urgently desired to have as large an attendance of Eastern members as possible. The Local Committee of Arrangements, consisting of Prof. W. B. POTTER, Washington University, and Mr. JAMES R. GAGE, have provided for excursions to a number of mines and metallurgical works in the State. Eastern members leave New York at 5 P.M., and Philadelphia at 8:20 P.M., on Monday, May 25th, via Pennsylvania Railroad, arriving at St. Louis at 1:45 P.M. on Wednesday. The fare from New York is $27 00; from Philadelphia $25 00.

The first session will be held on Wednesday, May 27th.

Members assemble at the Southern Hotel. A Council meeting will be held at the hotel at 4 P.M.

THOMAS M. DROWN, Secretary, 1123 Girard street, Philadelphia, Pa.


## 126th Auction Sale.

**50,000**
**TONS SCRANTON COAL.**
*On WEDNESDAY, MAY 27th, 1874.*

NEW YORK, May 20th, 1874.

The Delaware, Lackawanna and Western Railroad Company will sell, by MESSRS. JOHN H. DRAPER & CO., Auctioneers, at the Company's Sales Room, 26 EXCHANGE PLACE, corner of William Street, NEW YORK, on WEDNESDAY, May 27th, at 12 o'clock, noon,

**50,000 TONS**
OF
COAL, FROM THE LACKAWANNA REGIONS,

of the usual sizes, deliverable at the option of the Company at their Coal Docks either at Hoboken or Elizabethport during the month of June, 1874.

The sale will be positive; each lot put up will be sold to the highest bidder; no bids, in any form whatever, being made for account of, or on behalf of the Company. The conditions will be fully made known at the time of sale.

TERMS: FIFTY CENTS PER TON, payable in current funds, the day of sale, and the balance, within ten days thereafter, at the office of the Company.

SAMUEL SLOAN, President.

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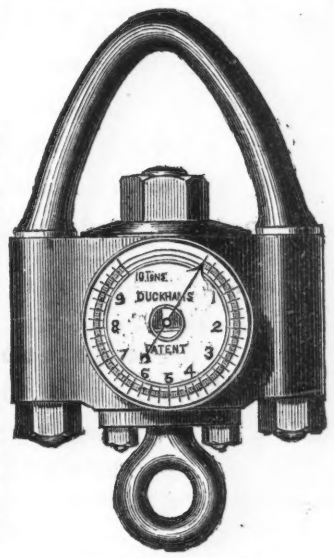


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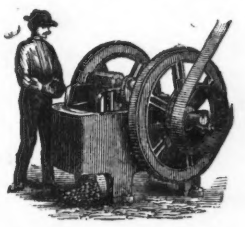

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☞ Reference to them is requested. may30-1y

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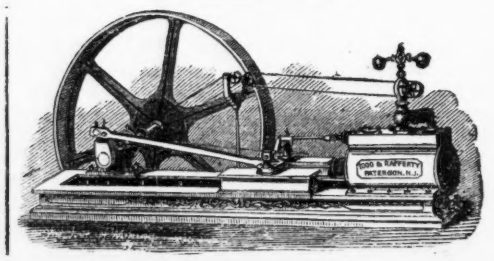


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NOTICE is hereby given that the annual meeting of the stockholders of the Scientific Publishing Company will be held on Wednesday May 27, 1874, at 12 o'clock, at the office, 27 Park Place, New York City. WM. VENTZ, Secretary.
may16-2t